



Accelerating The Growth of Digital Payments in India

A Five-Year Outlook
October, 2016





Accelerating The Growth of Digital Payments in India: A Five-Year Outlook



Preface

Over the past two decades, India has pushed hard to become a less-cash society. In the early 1990s, the Reserve Bank of India spearheaded the development of technological infrastructure that facilitated the creation of a payment and settlement ecosystem. In 2007, the Indian Parliament passed the Payment and Settlement Systems Act, after which the central bank released a series of vision documents for the periods of 2009–12, 2012–15, and 2015–18¹. These papers were supplemented by initiatives to promote wider acceptance and deeper penetration of electronic payments in India.

The Government of India has encouraged the shift to a less-cash society with its push for digital payments through the JAM Trinity: the Prime Minister's Jan-Dhan Yojana, Aadhaar, and mobile connectivity. We welcome the government's efforts, including the short and medium-term measures outlined in the Office Memorandum of February 29, 2016, to accelerate the adoption of digital payments.

To understand better how the country might benefit from increased digitisation of payments, this study endeavours to estimate the cost of cash to the Indian economy, and the possible gains from reducing the cost of cash over the next five years. The report also discusses policies and practices adopted by countries like Indonesia, South Korea, the United Kingdom, and Uruguay to help transition to a less-cash society. Based on these experiences, and taking into account the proposed measures and state of play, we propose a roadmap for India to achieve its goal of increasing the penetration of digital payments in the future. In doing so we layout stretch aspirations for the country.

We held consultations with eminent experts in this field during the course of our work, and would like to thank Ashish Aggarwal, consultant; Suyash Rai, senior consultant; and Professor Kavita Rao of the National Institute of Public Finance and Policy. We are also grateful to the following people for their generous input: Dr. Rajesh Shukla, the managing director and chief executive officer of People Research on India's Consumer Economy, for sharing proprietary household-level data on savings and expenditure from the Indian Consumer Economy Survey, 2013-14; Dr. M.S. Sriram, distinguished fellow, Institute for Development and Banking Research in Technology, and visiting faculty, Centre for Public Policy, Indian Institute of Management, Bangalore; Gopalaraman Padmanabhan, former executive director, Reserve Bank of India; Ashok Chawla, former finance secretary, Government of India; and Mukesh Sadana, a payments industry expert. In addition, we would like to thank colleagues at Axis Bank, HDFC Bank, State Bank of India, ICICI Bank, and Shishir Gupta and Jyoti Sekhsaria from McKinsey & Company.

We appreciate the efforts of the team from PricewaterhouseCoopers in conducting detailed research and analysis for the cost of cash model.

We hope this report will help enrich the ongoing policy dialogue on electronic payments in India, and provide the Ministry of Finance and the Reserve Bank of India with relevant ideas, and insights to shape the future of the country's digital payments industry.

Sincerely,

TR Ramachandran
Group Country Manager
India & South Asia

¹ Department of Payment and Settlement Systems, Reserve Bank of India. (2018). Payment systems in India: Vision 2018

Acknowledgment

The vision of Digital India, a flagship programme of the Government of India, is to promote mobile and digital banking to spur financial inclusion at scale. To achieve this vision, we are undertaking various measures to transition to a less-cash society. Achieving this goal would not only help reduce the size of the shadow economy in our country and the circulation of black money, but also lead to a significant increase in jobs.

I am glad Visa has undertaken this effort to produce a fact base on the cost of cash, and to outline a roadmap to transition India to a less-cash economy. It is an opportune time. The report will contribute to the stakeholder dialogue under way on this important matter.

I am glad to have the opportunity to release this report.

Sincerely,

Amitabh Kant
Chief Executive Officer
National Institute for Transforming India (NITI) Aayog
Government of India

5 October, 2016

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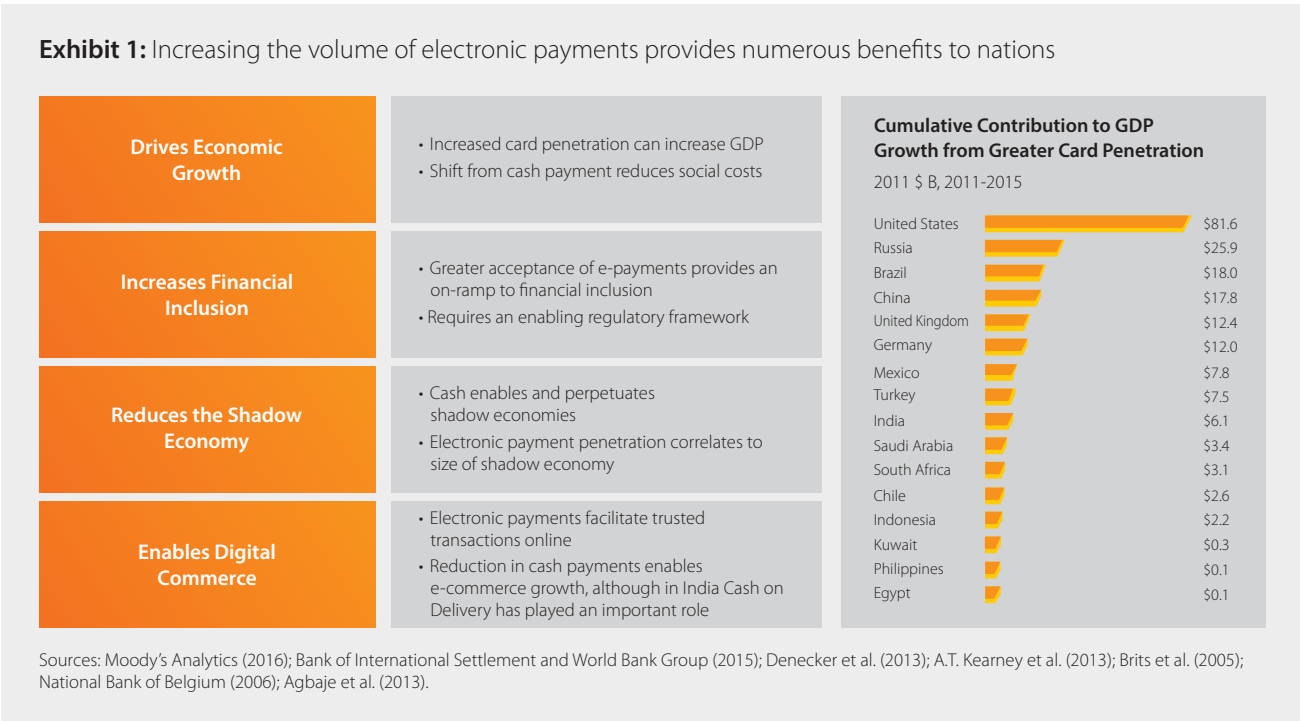
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Executive Summary

Introduction

Over the years, various studies have documented how countries could benefit moving from cash to digital payments. According to a 2016 Moody's Analytics study, card usage added USD 296 billion to global consumption, equivalent to a cumulative increase of 0.1 percent in global GDP and to the creation of about 13 million jobs between 2011 and 2015. Even with activation rates in single digits for India's over 660 million debit cards, their use added about 1.6 million jobs, and USD 6.1 billion² (INR 41,053 crores)³ to the country's GDP during this period. Peer countries have fared relatively better than India (Exhibit 1).



An analysis shows that in the area of electronic payments India's performance lags behind Brazil, China, and Russia. India trails because of its limited progress on financial inclusion. In 2014, more than 50 percent of Indian adults held an account with a financial institution compared with nearly 70 percent of adults in other BRIC economies⁴. We envision that the Prime Minister's Jan Dhan Yojana programme (PMJDY)⁵ and the launch of the Payments and Small Finance Banks would gradually address the issue of financial inclusion. So far, 242 million bank accounts have been opened and over 180 million debit cards issued under PMJDY, according to the Ministry of Finance⁶. While a great step forward, this process alone is not enough to help India transition to a less-cash society through increased use of digital payments.

² 2011 prices

³ The USD-INR exchange rate used in this report for all calculation purposes is 1 USD = INR 67.3

⁴ Reserve Bank of India: Report of the Committee on Medium-term Path on Financial Inclusion, 2015

⁵ Flagship programme of the government to open bank accounts for all citizens to further its financial inclusion goals

⁶ As of September 13, 2016, <http://www.pmjdy.gov.in/>

Six factors perpetuate the use of cash in India

In-depth discussions with industry experts and a review of literature suggest that three macro and three industry-specific issues impede the large-scale adoption of digital payments. They include:

1. A high propensity to save in and use cash

Indian households hold a majority of their wealth in physical assets like real estate and gold; however, even given limited financial assets, cash has a predominant place. Savings held in cash ranged from 40 percent in urban India to 27 percent in rural areas, according to the Indian Consumer Economy Survey 2013-14⁷. Further, cash-intensive supply chains among various businesses require merchants to maintain cash balances to meet working capital needs. Such a high intensity of cash use results in a preference for cash payments by merchants. No charges for the first five ATM transactions by customers also contribute to increasing the flow of cash in the economy.

2. A large shadow and remittance-based economy

India has a large shadow economy and informal labour market. The size of India's shadow economy is about 19 percent of GDP⁸. The slow pace of job creation in the formal sector has played a role in the growth of the shadow economy. India's weak educational and vocational training systems as well as land and labour policies have led to the expansion of contract and wage labour in industries like construction, footwear, and textiles and garments and subsequently to growth of the informal economy. Often individuals and businesses in the informal sector are reluctant to transition to the formal sector. Their reasons could include fear of tax authorities, general tax avoidance motivations, and more importantly, lack of understanding of the benefits of association with the formal economy.

Many Indians have migrated overseas in search of better work prospects, while others have relocated from rural to urban areas. In fact, India is one of the largest remittance markets in the world. It was the biggest recipient of cross-border inbound remittances in 2015, with more than USD 70 billion⁹ received; domestic remittances are estimated at USD 9 billion¹⁰. Studies have shown that the primary use of remittances, both international and domestic, is for support of the migrant's family in his or her place of origin. More than 60 percent of remitted funds are for day-to-day spending,¹¹ and the assumption is that most of these transactions are cash-based.

3. Gender imbalance in the use of digital payments

The gender divide in adoption of financial services is staggering. The marginalisation of women in financial decision-making and the labour market has alienated them from the financial system. According to a 2014 World Bank survey, only 0.38 percent of women above 15 years old used the internet to make payments compared with 2.04 percent of men; 3.25 percent women had used a debit card versus 5.25 percent of men¹².

4. High cost of acceptance infrastructure

The cost of a point-of-sale (POS) terminal in India ranges from INR 8,000 (USD 118.9) to INR 12,000 (USD 178.3); countervailing duties and taxes account for about 20 percent of the price. In addition, the annual operating cost is INR 3,000 (USD 44.6) to INR 4,000 (USD 59.40) per terminal¹³. That covers paper and servicing costs, amounting to about INR 3.9 billion (USD 60 million) annually for all installed 1.3 million terminals¹⁴. Further, low transaction volumes and ticket sizes at smaller merchants, especially outside of Tier 1 cities, make it unviable for banks to expand their footprint into such segments¹⁵.

⁷ Survey by People Research on India's Consumer Economy, ICE360

⁸ Policy Research Working Paper 5356; The World Bank Development Research Group Poverty and Inequality Team & Europe and Central Asia Region, Human Development Economics Unit, July 2010

⁹ World Bank Bilateral Remittance Matrix, 2014

¹⁰ Das, A. (2012). Including the Poor: Need for Reforms in Remittances, IIT Bombay

¹¹ NCAER. (March 2014). National Remote Payments Survey

¹² World Bank Financial Inclusion Database, 2014

¹³ Industry interviews including banks and suppliers of point-of-sale terminals

¹⁴ RBI: Concept Paper on Card Acceptance Infrastructure, 8 March, 2016

¹⁵ Expert interviews

5. Regulatory limitations

In September 2012, the Reserve Bank of India introduced a cap on the merchant discount rate (MDR) on debit card transactions¹⁶. This essentially reduced the MDR in the market by 50 percent and also resulted in the interchange fees paid to the issuing bank being reduced correspondingly. The MDR was capped at an ad-valorem rate of 0.75 percent for debit card transactions below INR 2000 (USD 29.70) and 1 percent for transactions above INR 2,000. It was envisaged that this cap would increase the acceptance infrastructure and grow debit card transactions and usage exponentially. By reducing cost, this has not been the case, as the Reserve Bank of India (RBI) has found¹⁷.

6. Insufficient focus on financial literacy

A study by Micro Save, "Assessment of Bank Mitrs (BMs) Under Pradhan Mantri Jan Dhan Yojana (PMJDY)"¹⁸ shows that lack of financial literacy is one of the main reasons for the high customer bank account dormancy, estimated to be 28 percent under the flagship PMJDY scheme by this survey. The report states that "Dormancy in accounts can mostly be attributed to factors such as lack of information on operational procedures, product features, and opening of duplicate accounts". Further, a study by CGAP in India and Indonesia showed that while the demand for financial education is quite high, financial training sessions have not been as effective as desired because of the classroom-based pedagogy followed¹⁹.

For these reasons, amongst others, India is a high cash-use society. What often goes unrecognized, however, is that cash carries a significant cost.

India's net cost of cash is 1.7% of GDP

We endeavour to estimate the cost of cash to the Indian economy, based on approaches followed by central banks globally and publicly available data. For our study, we have followed a framework used by Germany's Bundesbank, and we focus on four key stakeholder groups – households, business-to-consumer organisations, banks, and the central bank²⁰.

To compute the cost of cash, we estimated internal and external components of the cost of cash of the four stakeholders using secondary data sources from the government, the Reserve Bank of India, and industry participants as well as heuristic estimates and proprietary data. Internal cost represents the opportunity cost of the time, effort, and resources spent, and the cost of operating and maintaining cash infrastructure (for organisations). External cost is payments to other participants for services rendered such as cash withdrawals, moving, and managing cash. Our analysis reveals that significant internal cost, and thereby lost economic potential, is the key factor behind the comparatively higher cost of cash for the Indian economy.

Applying this approach, we estimate the net cost of cash as 1.7 percent of India's real GDP in 2014-15. This cost is predominantly borne by four stakeholders – households, businesses, banks, and the central bank²¹. Further, foregone tax revenues from the shadow economy, estimated to be 19 percent of India's GDP, account for 3.2 percent of India's GDP (Exhibit 2).

¹⁶ Merchant Discount Rate is the fee paid by merchants to the acquirers for helping facilitate the use of digital payments

¹⁷ RBI: Concept Paper on Card Acceptance Infrastructure, 8 March, 2016

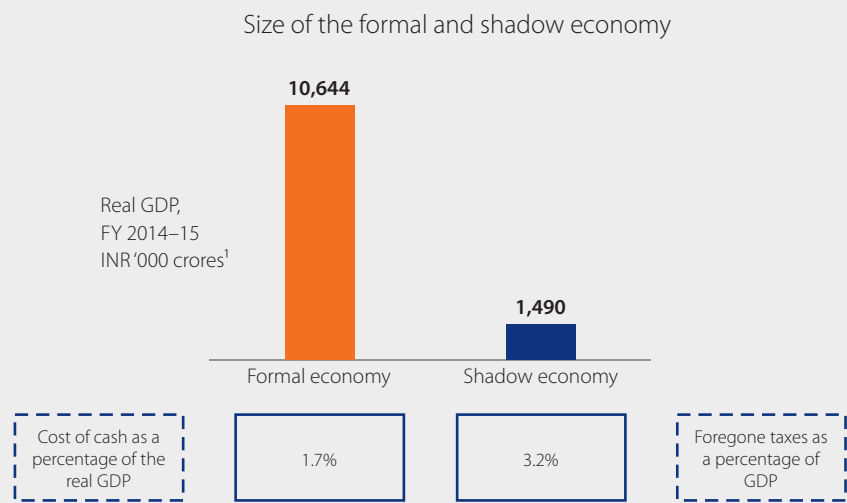
¹⁸ MicroSave, "Assessment of Bank Mitrs (BMs) Under Pradhan Mantri Jan Dhan Yojana – Wave III," January 2016

¹⁹ "Prices or Knowledge? What Drives Demand for Financial Services in Emerging Markets?" Sawan Cole, Thomas Sampson, Bilal Zia, CGAP 2011

²⁰ This work does not take into account the cost incurred for government-to-person, person-to-government, and business-to-business cash payments

²¹ We are unable to provide the cost of cash to the Government of India and business-to-business transactions because of data constraints

Exhibit 2 : India’s cost of cash is 1.7% of GDP and foregone tax revenues from the ‘shadow’ economy account for 3.2% of GDP



Note: Shadow economy includes all market-based legal production of goods and services that are deliberately concealed from public authorities to avoid:

- Payment of income, value added, or other taxes
 - Payment of social security contributions
 - Meeting certain legal labor market standards, such as minimum wages, maximum working hours, safety standards, etc.
 - Complying with certain administrative procedures, such as completing statistical questionnaires or other administrative forms
- ¹ - One crore equals ten million rupees

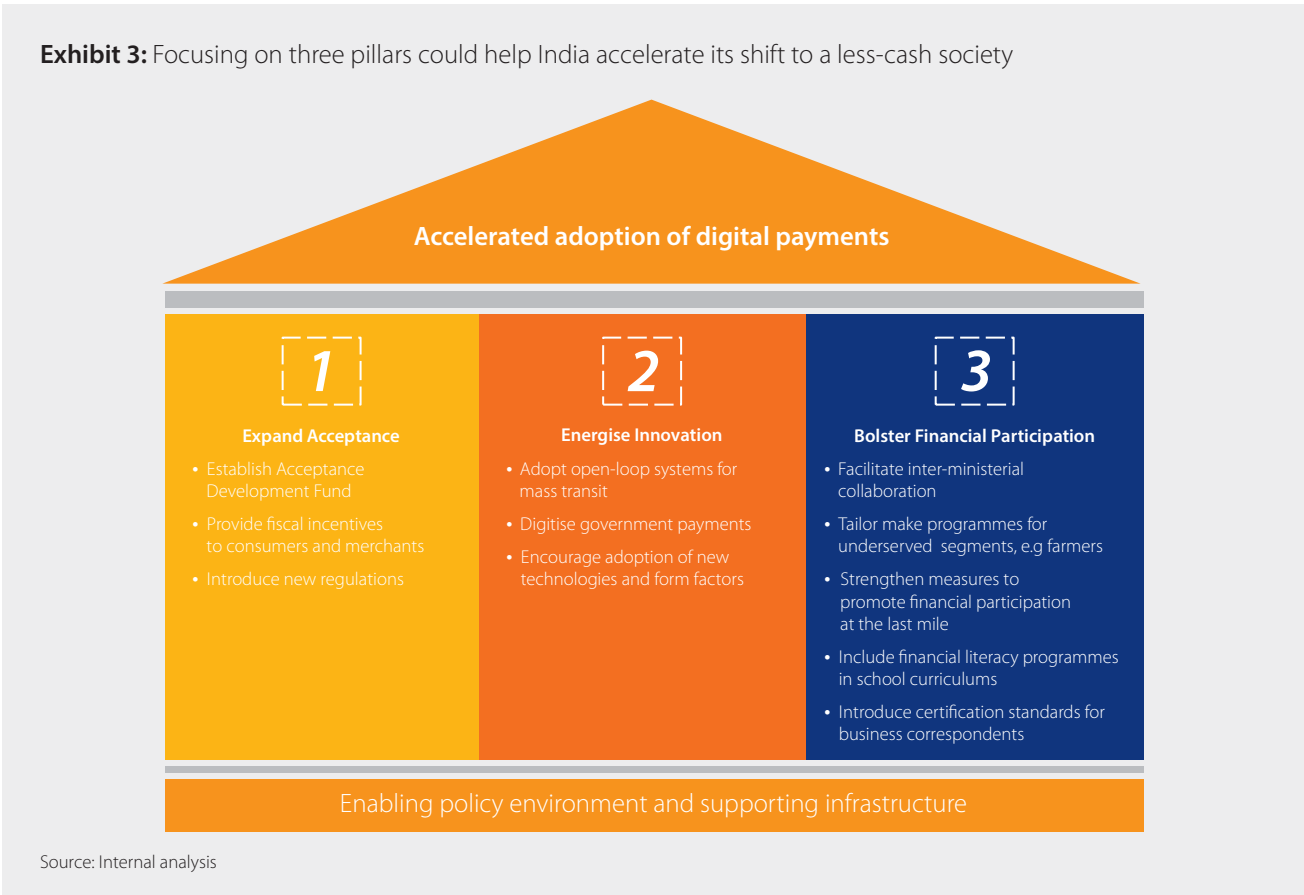
Sources: Economic Survey 2015-16; Policy Research Working Paper 5356; The World Bank Development Research Group Poverty and Inequality Team & Europe and Central Asia Region, Human Development Report 2010; internal analysis

To understand fully the cost of cash for each stakeholder, we analyse the various components of the “gross” cost of cash – that is, the sum total of internal and external costs. A decomposition of the gross cost of cash shows that micro enterprises bear the highest cost of cash, at 1.4 percent of GDP, while the blended rate for all business-to-consumer organisations, including large players, is 0.6 percent of GDP. For households, this cost is estimated at 0.9 percent of GDP, while for banks it is 0.4 percent of GDP. Finally, for the central bank, this cost is 0.04 percent, 97 percent of which accounts for currency printing. We discuss the details of the constituents of the cost of cash for each stakeholder in the next chapter.

Such a huge burden on the economy offers the Government of India a clear rationale for accelerating the shift from cash to digital payments. Over the last decade, measures like the introduction of Real Time Gross Settlement in 2004, National Electronic Funds Transfer in 2005, the passage of the Payment and Settlement Systems Act in 2007, and the launch of Immediate Payment Services in 2010 have helped expand payment digitisation. In 2015, the Indian Government made a strong commitment to transition India to a less-cash society, and in February 2016 a series of measures were announced to guide the country down this path. Until this time, banks, payment networks, prepaid payment instrument providers, and microfinance institutions largely led the efforts to increase the use of digital payments. These include launching and promoting the use of payment instruments; promotions aimed at spurring consumer usage, including cash-back programmes; more effective consumer protection; and investments in innovation and financial literacy.

India needs to adopt a three-pronged strategy to accelerate growth of digital payments

To further the dialogue on ways to promote digital payments, we have undertaken an exhaustive study of approaches used by governments around the world. Our analysis shows that India would benefit from adopting a three-pronged strategy to transition to a less-cash society (Exhibit 3).

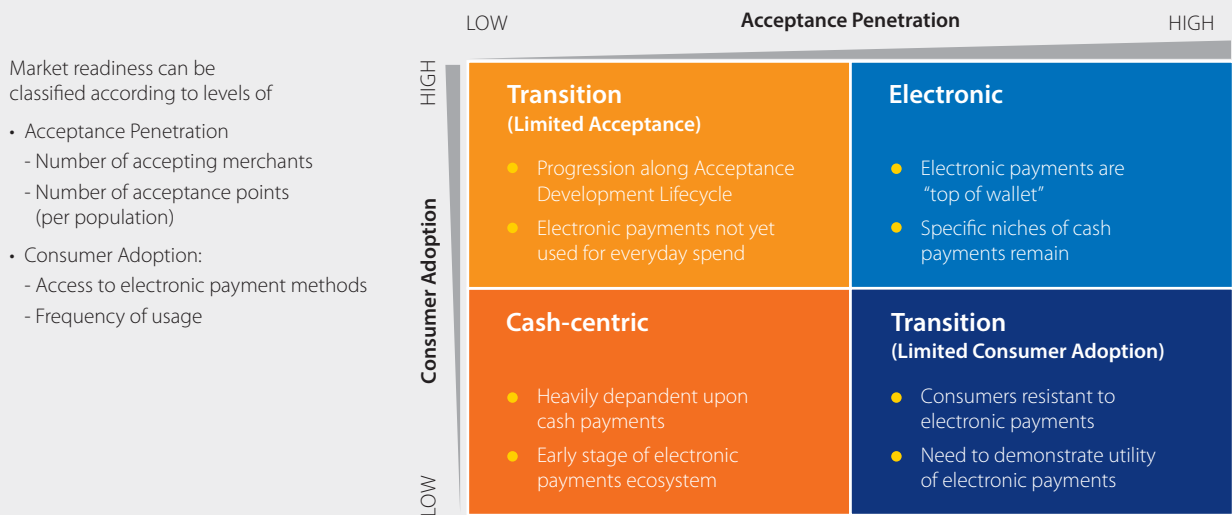


1 Expand Acceptance

To identify ways to expand acceptance, Visa classifies countries into four buckets, given their level of acceptance penetration and consumer adoption (Exhibit 4)²². With an installed base of 1.3 million point-of-sale terminals and about 5 percent of personal consumption expenditure incurred digitally²³, India is in transition in both the areas of acceptance penetration and consumer adoption. We found three policy levers that have helped accelerate such a transition – establishing an acceptance development fund; providing fiscal incentives to both consumers and merchants, and supplementing them with administrative sanctions; and introducing regulations to spur the shift to digital payments.

²² Perspectives on Accelerating Global Payment Acceptance, Visa, April 2016
²³ This does not include real-time gross settlement systems, net banking, and automated clearing house transactions

Exhibit 4: A country's approach to expanding acceptance will depend upon its readiness for electronic payments



Perspectives on Accelerating Global Payment Acceptance, Visa, April 2016
<https://usa.visa.com/dam/VCOM/download/visa-everywhere/global-impact/perspectives-on-accelerating-global-payment-acceptance.pdf>

Drawing from experiences of other countries and adapting them to the Indian context, we propose that the Government of India consider the following measures:

A. Establish an acceptance development fund:

The fund could increase the use of digital payments in under-penetrated categories. A fund with a corpus of about INR 1,000 crores (USD 153 million), with contributions from all stakeholders in the payments industry, could add about 2.7 million acceptance points²⁴. The Reserve Bank of India has been working expeditiously on such an industry-led fund over the past several months.

B. Fiscal incentives:

- The government could consider incentivising, for a specific period, small and medium-sized enterprises (SMEs) and individuals to promote a shift in behavior. It could provide –
- i. SMEs a 50 percent reduction in income-tax liability on 50 percent of their revenue²⁵.
 - ii. Individuals with a 5 percent income tax break on 20 percent of their electronic spending, with a cap of INR 2,000 (USD 29.7) per individual per year²⁶.
 - iii. Another way to disburse incentives could be to offset them by providing rebates on payments made through Bharat Bill Payment System. In this approach, the Government of India could compensate the revenue shortfall to entities receiving payments through this platform.

We estimate that this basket of incentives would cost the exchequer INR 58,000 crores (USD 8.6 billion) over the next five years (Exhibit 5). Such incentives, aimed at spurring behavioural changes among consumers and businesses, are likely to motivate banks and other payment service providers to grow the market. Banks may then give a wider range of merchants the opportunity to receive payments electronically, and to allow consumers to pay through innovative digital instruments. Banks would have to invest about INR 11,891 crores (USD 1.8 billion) on network expansion and upgrades (Exhibit 6), including increasing the number of automated teller machines (ATMs), bank branches, and point-of-sale terminals, and incur merchant and customer acquisition costs²⁷.

²⁴ Mobile point-of-sale terminals have been used for this calculation
²⁵ The government is proposing a corporate tax rate of 25 percent over the next four years. Hence, a 50-percent reduction would amount to a 12.5 percent tax rate
²⁶ The USD-INR exchange rate used in this report for all calculation purposes is 1 USD = INR 67.3
²⁷ It is important to note that the additional investment made by banks to expand acceptance would only be toward the cost of mPOS machines and consumer and merchant acquisition costs

Exhibit 5: The Government of India could consider investing about INR 58,000 crores over the next 5 years to drive growth of digital payments

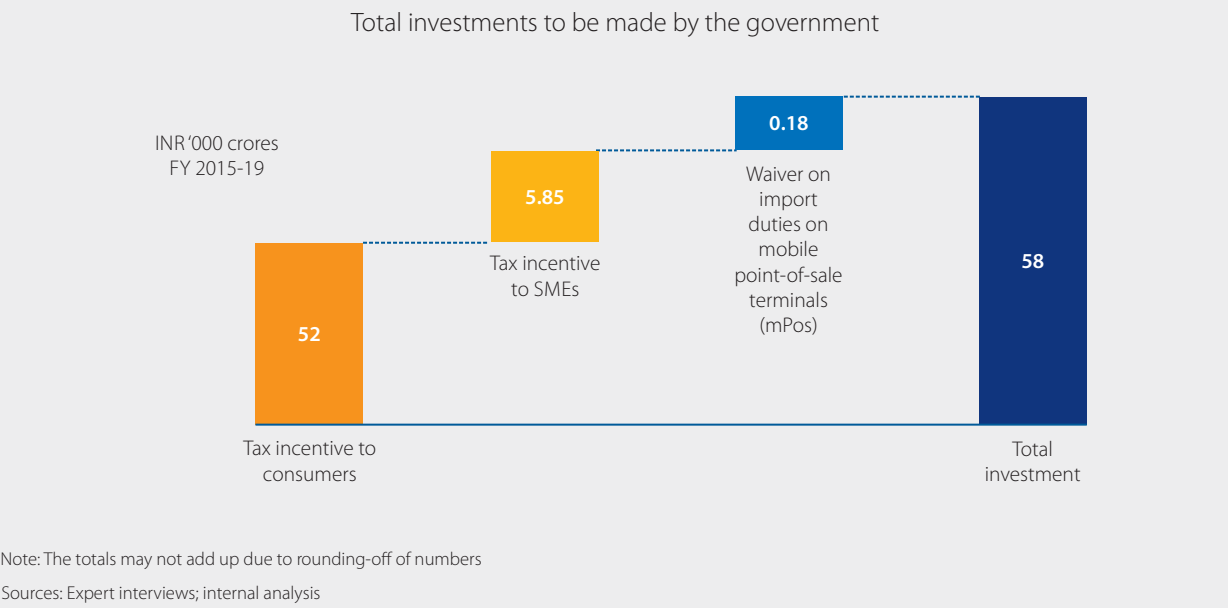
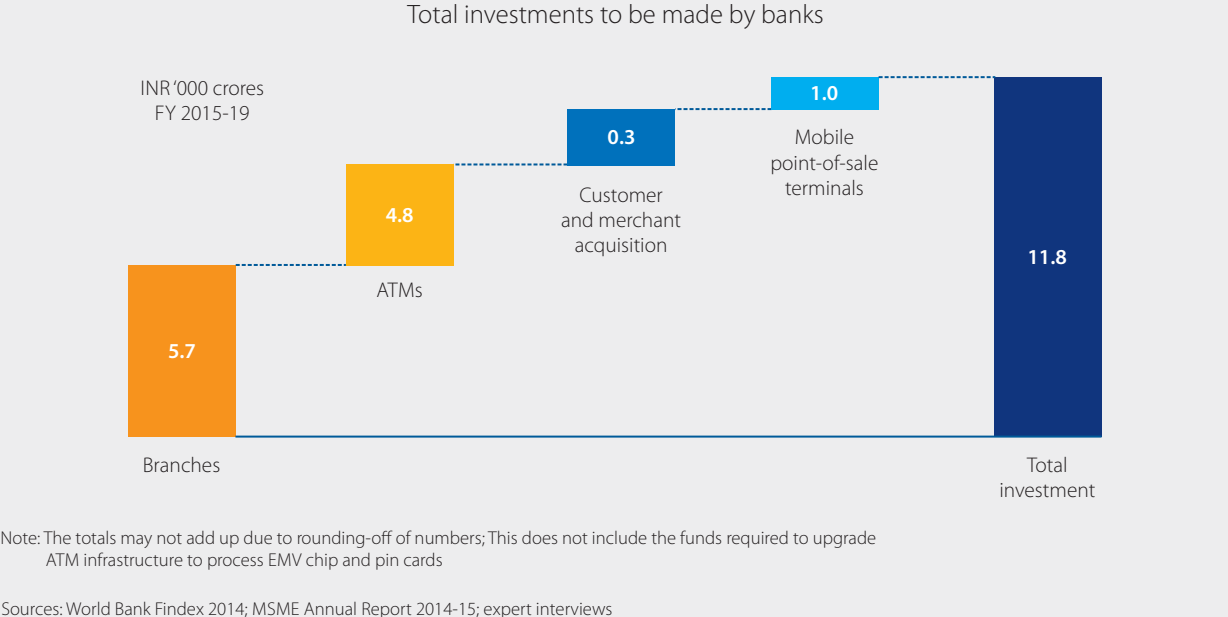


Exhibit 6: Banks could invest INR 11,891 crores over the next 5 years, of which about INR 1,300 crores would be to increase acceptance points



C. Introduce new regulations:

Active dialogue to introduce several new regulations is under way. For example, the Ministry of Finance, in its memorandum on accelerating growth of card and digital payments, suggested mandating thresholds for cash payments²⁸. In its report on black money, the special investigation team appointed by the Supreme Court of India

²⁸ Office Memorandum dated 29th February, Currency & Coinage Division, Department of Economic Affairs, Ministry of Finance, Government of India

recommended capping cash transactions above INR 3 lakhs (USD 4,450) and restricting cash holding by individuals and industry to INR 15 lakhs (USD 22,288). In addition, the government could consider a few other measures, including:

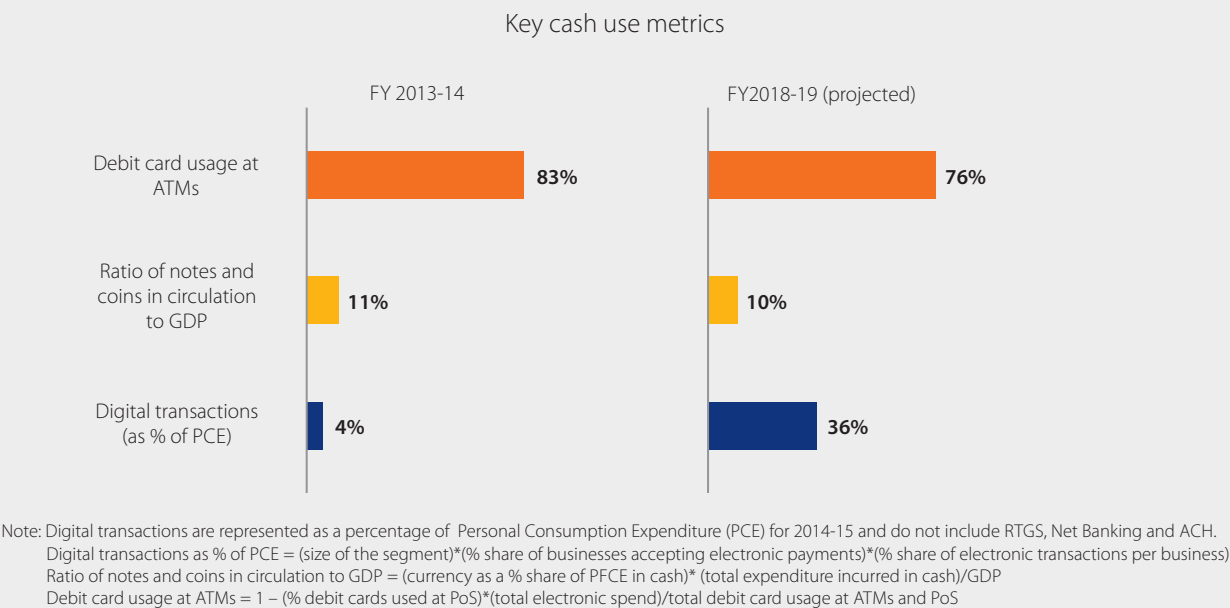
- i. Lowering import duties on point-of-sale terminals to 5 percent, and promoting domestic manufacturing of acceptance devices under the country's Make in India programme.
- ii. Introducing regulations that promote digital payment of salaries by all enterprises, including micro, small, and medium enterprises, as Uruguay has done²⁹. Even households could be encouraged to do the same. This could significantly reduce the flow of cash in the economy. A survey from the "Beyond Cash" report of USAID shows that those earning and saving digitally have 2.5 times higher propensity to spend digitally.

D. Additional measures to spur acceptance could include:

- i. Developing specific criteria to allow large global companies to participate independently in the acquiring business³⁰. Such a move would increase the number of players, leading to higher competition and bringing best practices to the market.
- ii. Developing a central repository to track the payment history of consumers. Doing this would enable institutions to understand better the expenditure patterns and needs of consumers. In turn, it would provide valuable insights to various stakeholders, including banks, and could help them expand the acquiring business.

Our analysis suggests that implementation of the proposed measures by the Government of India and banks would increase the numbers of acceptance points three-fold to about 4 million from 1.3 million today³¹, and add about 40.9 million households to the financial system. These actions would enable India to significantly increase the adoption of digital payments (Exhibit 7). Further it could result in savings of about INR 70,000 crores (USD 10.4 billion) over the next five years.

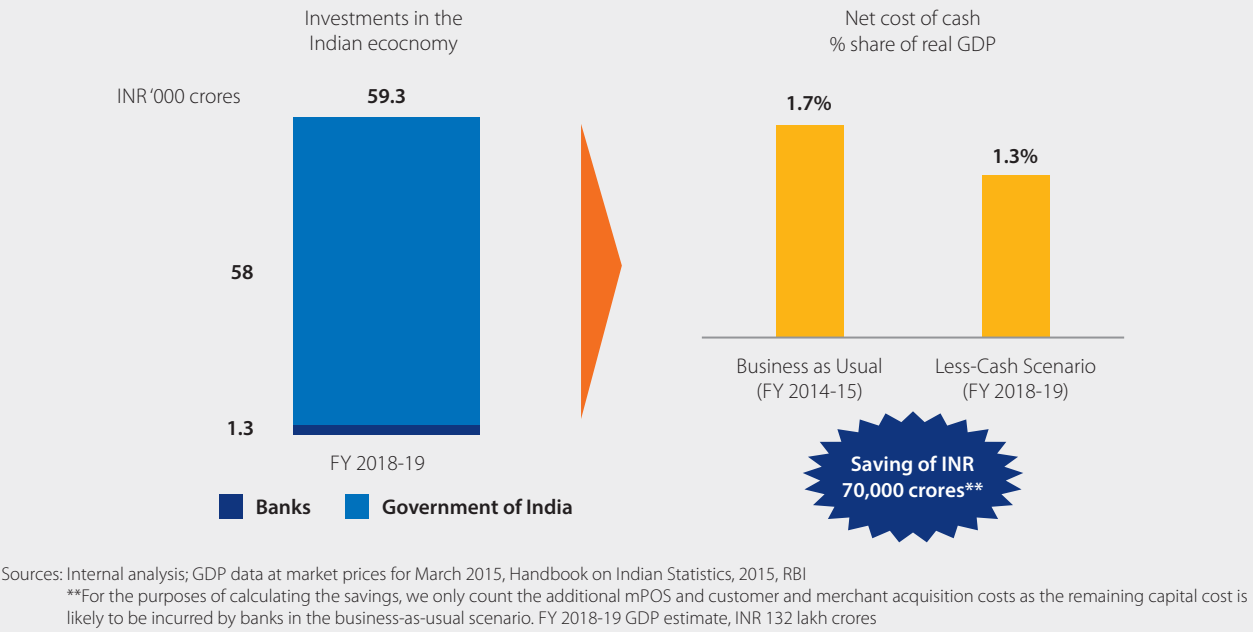
Exhibit 7: Such investments could significantly improve India's performance on key cash-use metrics



Sources: Statistics on payment, clearing, and settlement systems in the CPML countries, 2014, BIS; internal analysis

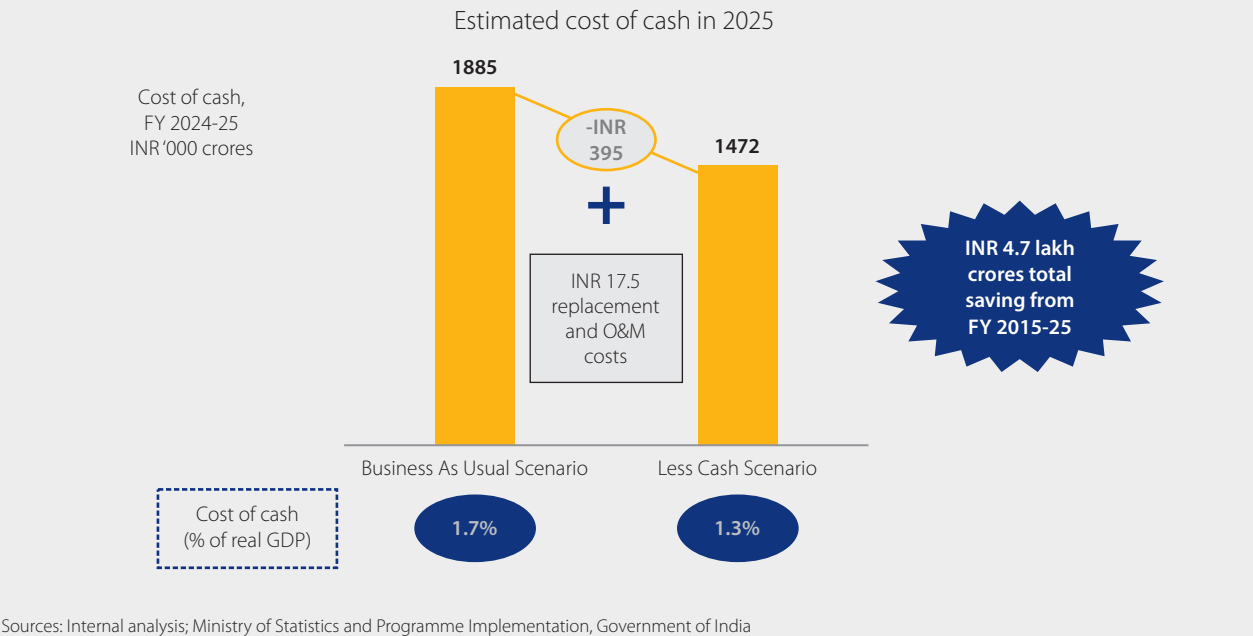
²⁹ Electronic Payments, Economic Formalization, and Financial Inclusion: The Uruguayan Case; study commissioned by Visa and CPA Ferrere, 2015
³⁰ Acquirers can be banks or payment aggregators that facilitate the payment and settlement of digital payments made by consumers to merchants
³¹ RBI: Concept Paper on Card Acceptance Infrastructure, 8 March, 2016

Exhibit 8: For a total investment of about INR 60,000 crores over 5 years, India could reduce its cost of cash from 1.7% to 1.3% of GDP



If India could sustain a reduced cost of cash of 1.3 percent of GDP³² until 2025, the value of savings accrued would steadily rise. India could save up to an additional INR 4 lakh crores (USD 59.4 billion) by FY 2024–25 (Exhibit 9)³³. In summary, the total savings by 2025 could be INR 4.7 lakh crores (about USD 70 billion) with the appropriate policy initiatives in place and followed by effective execution.

Exhibit 9: A 0.4% reduction in the cost of cash could provide India with additional saving of INR 4 lakh crores by FY 2024–25



³² For all calculation purposes, this report has used an average real GDP growth rate of 7.5 percent for GDP projections until FY 2024-25. The average real GDP growth rate comes from the World Bank database, IMF World Economic Outlook, October 2015, Economic Survey of India 2014-15, Volume II, and RBI Monetary Policy Report, September 2015

³³ INR 1 lakh crore = INR 100,000 crores, where INR 1 crore = INR 10 million

2 Energise Innovation

The payments industry is being disrupted both in India and globally. The establishment of Small Finance and Payments Banks, the launch of the government's flagship programme Start-Up India, a rapidly growing fintech sector - with new initiatives such as the Unified Payments Interface - are examples of the big changes under way. With the Aadhaar-enabled³⁴ direct-benefit transfer programme for government-to-person disbursements, efforts to shift to digital payments are being further strengthened. Collaboration between various stakeholders – academia, traditional financial service providers, and technology firms – to co-invest and co-create has the potential to dismantle barriers to digital payments at an accelerated pace. With the flagship programme Start-Up India, this model has begun to resonate in India. Globally, some leading financial institutions like the Development Bank of Singapore and Barclays have established different approaches to either collaborate with academia or establish incubation centres to foster co-creation.

All these developments provide India with a unique opportunity to leapfrog and move quickly to a digitally enabled payment system. However, this will require an evolving policy and regulatory framework to encourage innovation. Transit, government payments, and measures to promote new technologies and form factors are three areas, amongst others, in which such a framework would be helpful.

A. Mass transit

We recommend adopting open loop systems for person-to-government transactions that enable the use of bank-issued contactless chip cards for payments for public transport services. To begin with, adopting such a system for mass-transit payments would ensure citizens could use mass-transit systems across the country without purchasing additional tickets or banks reissuing new cards or separate ones for transit systems. Eventually various contactless-enabled devices could be used as payment instruments. London has introduced an open loop system, and other cities in Asia, including Jakarta and Singapore, are evaluating them. The Reserve Bank of India's Payment Vision 2018 also emphasises the need for interoperable payment mechanisms for mass-transit systems built on open standards, preferably using open-system payment instruments.

B. Government payments

The adoption of digital procurement cards by the Government of India's nearly 70 departments could yield additional savings. Governments worldwide have benefitted significantly by adopting this approach. For example, the introduction of the Government Procurement Card in the United Kingdom led to savings of about EUR 1 billion. Equally expediting the process to digitise person-to-government payments could be another way to accelerate the shift to a less-cash society.

C. New technologies, new form factors

India needs innovation that would help overcome challenges associated with financial inclusion – last mile connectivity, infrastructure, and the high cost of doing business in remote areas. Promotion of mobile-based payment solutions, focus on interoperability, and measures to increase penetration of near field communication technology (NFC) will prove beneficial. Innovations that enhances customer security, ease-of-use, and are widely available are also important. Adapting such innovations to meet the differing needs of urban and rural citizens would significantly enhance the growth of digital payments.

Finally, steadfastly focusing on enhancing safety and security of digital payments while improving consumer experience would help accelerate the adoption of digital payments. Equally, efforts to increase customer awareness and robust customer grievance redressal would play an important role in building consumer confidence in innovative digital payment instruments.

³⁴ Aadhaar is a 12-digit individual identification number issued by the Unique Identification Authority of India (UIDAI) on behalf of the Government of India. This number will serve as a proof of identity and address, anywhere in India. Any individual, irrespective of age and gender, who is a resident in India and satisfies the verification process laid down by the UIDAI can enrol for Aadhaar. Each individual needs to enrol just once and it is free. Each Aadhaar number will be unique to an individual and will remain valid for life. An Aadhaar number helps provide access to services like banking and mobile phone connections and will aid access to other government and non-government services in the future.

3 Bolster Financial Participation

India has made progress in this area through various initiatives undertaken by the Reserve Bank of India, the Government of India under the aegis of the Prime Minister's Jan Dhan Yojana, and numerous microfinance institutions. Still, much remains to be done. According to the Reserve Bank of India's midterm financial inclusion report for 2015, more than 50 percent of adults participate in the financial system. However, few of the large numbers that remain excluded from the financial system recognise that they pay an exorbitantly high rate of interest for cash borrowings to meet various needs. A June 2016 report, "The unintended consequences of India's battle with black money," by the investment bank Ambit suggests that borrowers in the shadow economy are paying interest rates of as much as 34 percent; this number may be even higher for those near the bottom of the pyramid. For example, a street vendor often pays as much as 5 percent a day in interest. Such lack of financial knowledge also can facilitate various types of fraud³⁵.

Today, efforts to improve financial literacy are undertaken by the central bank as well as by banks, microfinance institutions, and institutions like the National Bank for Agriculture and Rural Development (NABARD), the National Stock Exchange, the Bombay Stock Exchange, and the Securities and Exchange Board of India. A "Seven State Financial Literacy Assessment Study" by the United Nations Development Programme³⁶ compares the efforts of formal channels like the Reserve Bank of India and NABARD to informal channels like self-help groups, microfinance institutions, and NGOs. The study showed that the scale of informal channels has been much bigger – 48 participating organisations compared with only 8 formal institutions. Even though the content covered by formal channels was wider and the programmes longer, the practical exposure to financial transactions made the knowledge retention and awareness of participants of informal channels equal or even better than those participating in formal programmes. To bolster financial participation, India would benefit from focusing on five areas, amongst others:

- A. Facilitating inter-ministerial collaboration at the centre and engagement with states to leverage existing programmes and platforms, for example, mKisan³⁷
- B. Designing programmes tailored to meet the needs of various types of underserved segments such as women and farmers
- C. Strengthening efforts to promote financial participation at the last mile, working in collaboration with existing microfinance institutions in different states
- D. Crafting approaches to inculcate financial literacy programmes at the school level and in higher education, and as part of public service education
- E. Introducing certification standards and constructing innovative models for business correspondents

Strengthen the enabling infrastructure

Improving the quality of digital infrastructure that forms the backbone of digital payments is also important. Expedient rollout of the National Optic Fibre Network (NOFN), incentives to companies to manufacture point-of-sales terminals under the Make in India programme, and progressive regulations under Digital India would help accelerate adoption of digital payments. Measures to promote indigenous production of hardware components could be helpful.

In conclusion, India has a big opportunity to advance the development of its payments system and achieve important national objectives such as enhancing financial inclusion, promoting transparency, and widening the tax base. In turn, this would encourage a virtuous cycle of economic growth and job creation. Pursuing the policy, regulatory, and infrastructure changes necessary to leapfrog and modernise India's payment systems will be important to achieve the government's vision of a less-cash, technology driven, secure, and competitive digital payments industry.

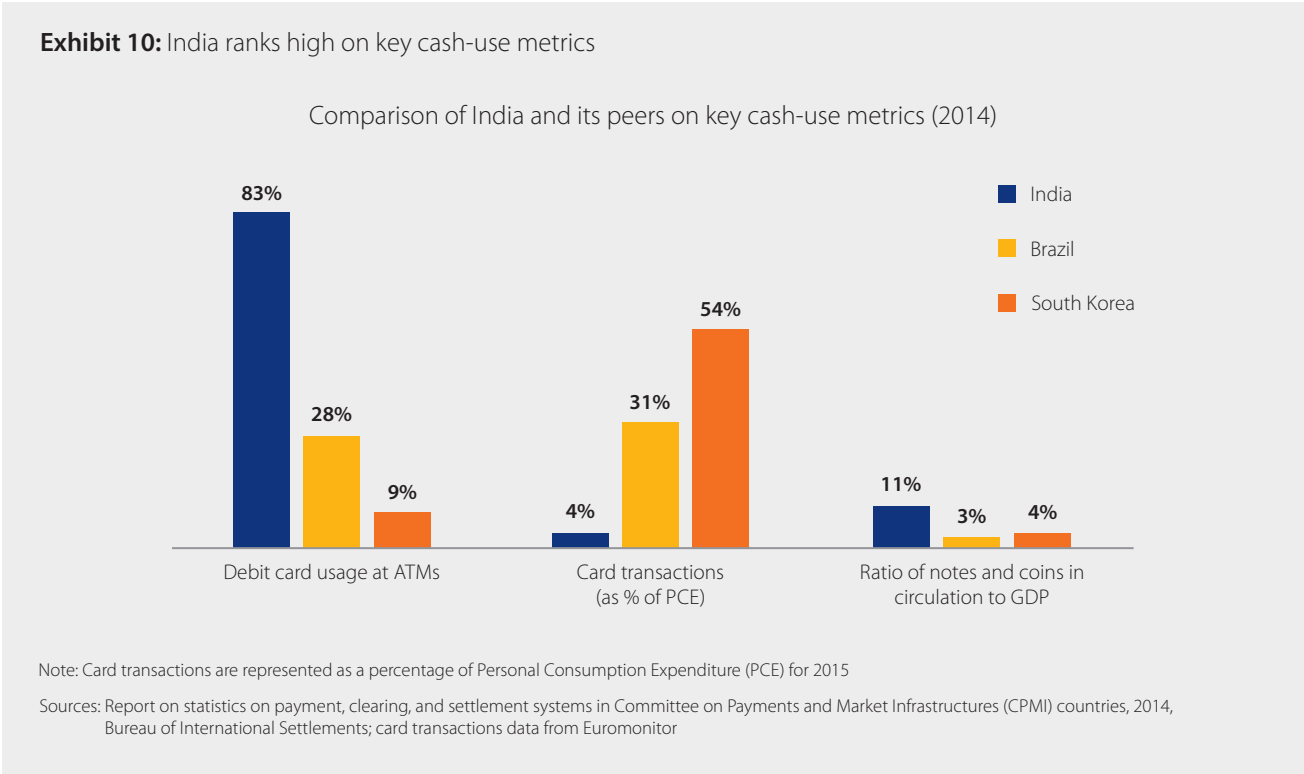
³⁵ Chit fund frauds in recent times

³⁶ Financial literacy as a tool for financial inclusion and client protection, UNDP, 2012

³⁷ mKisan is an SMS portal for farmers that enables all central and state government organisations in agriculture and allied sectors to provide farmers with information, services, and advisories in their respective language and location

An estimation of India's cost of cash

Three metrics illustrate India's high volume of cash in circulation – debit usage at automated teller machines (ATMs), percentage of personal consumption incurred digitally, and the ratio of notes and coins in circulation to GDP. India scores poorly on all three relative to comparable economies (Exhibit 10). It is seldom recognised that this amount of cash in circulation comes at a significant price to the economy.



Our approach to computing the cost of cash

Few studies exist about the cost of cash in India but those that have been done point to the economic burden cash imposes. We have sought to make a system-wide estimate of the cost of cash, and decided to approach the topic afresh by using a methodology that captures all costs to important stakeholders. Our methodology builds income and expenditure flows for households, businesses, banks, and the central bank, identifies the incidence of cash usage across these flows, and maps the cost of accessing, managing, and moving cash (Exhibit 11).

The approach is “ground up,” even as it draws on numerous secondary data sources and employs a range of estimation and approximation techniques to neutralise payment flows across stakeholders. Leading central banks use this methodology, including Germany’s Bundesbank, Sweden’s Sveriges Riksbank, and the European Central Bank. They all have conducted studies analysing the economic costs and benefits of various payment instruments, including cash, with a view to guiding policymaking³⁸.

In an important methodological choice, we focused on consumer-driven cash transactions, and have, as such, omitted business-to-business (B2B) transactions as a dimension in our model. We took this path because of paucity of data on B2B activity in India. We based the consumer-focused approach on the model adopted by the Bundesbank.

³⁸ Germany’s unique position as a cash-intensive developed economy has led the Bundesbank, in particular, to focus on analysing the cost of cash. The Bundesbank arrives at the cost of cash for various stakeholders in their respective economies by considering several different subsets of possible costs. The figures range from 0.5 to 2 percent of GDP. We offer a fuller presentation of the methodology in Appendix 2.

Exhibit 11: A 5-step process to estimate the explicit and implicit costs of cash by stakeholder¹



¹This report does not reflect the cost of cash incurred by the Government of India and B2B organisations, and only analyses the central bank’s cost of cash
Source: Internal analysis

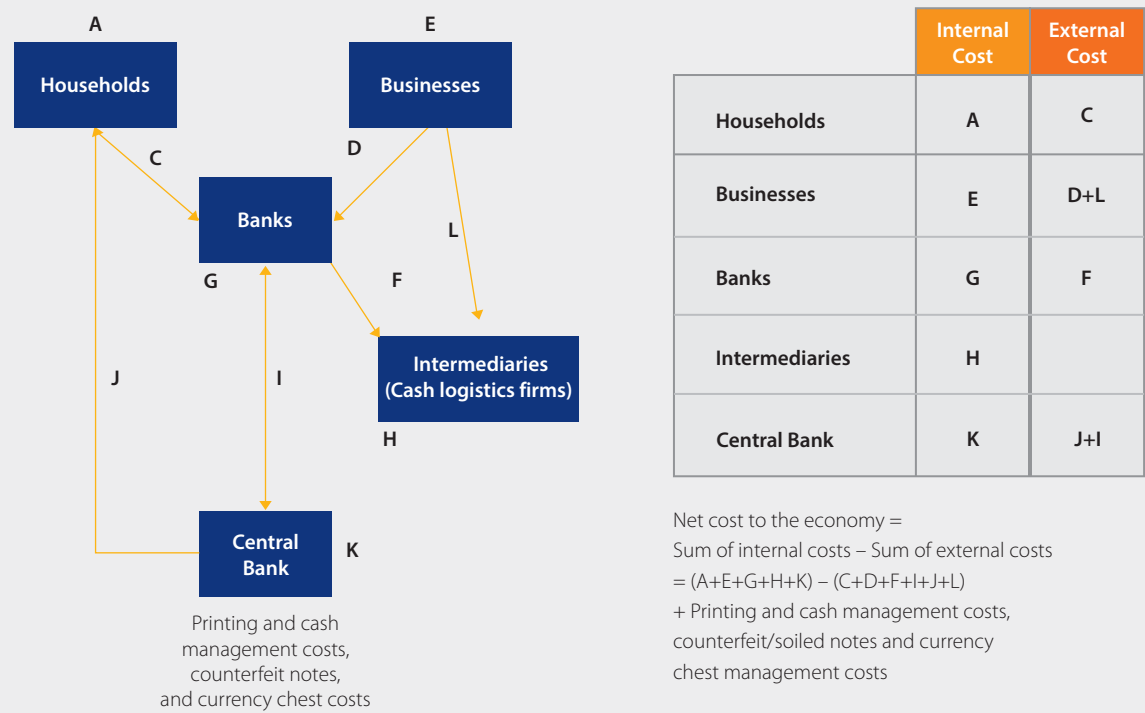
For each participant within the chain, the cost of using and managing cash manifests itself internally and externally. Internal cost represents the opportunity cost of the time, effort, and resources spent, and the cost of operating and maintaining cash infrastructure (for institutions). External cost is payments to other participants for services rendered related to withdrawing, moving, and managing cash. For the central bank, the primary source of internal costs is the cost of creating, printing, and managing currency notes and coins. The table below presents a list of internal and external costs considered for each stakeholder. We do not consider second-order effects of these costs.

Table 1: List of internal and external cost considered for the four stakeholders

Stakeholder	Internal costs	External costs
Households	<ul style="list-style-type: none">• Opportunity costs of time spent accessing and using branches and ATMs• Expected loss due to the risk of holding cash• Interest foregone on average cash holdings	<ul style="list-style-type: none">• Transaction fees paid to banks for use of ATMs and branches
Businesses	<ul style="list-style-type: none">• Opportunity costs of time spent handling and managing cash• Depreciation on cash infrastructure• Expected loss linked to the risk of holding cash• Interest foregone on average cash holdings	<ul style="list-style-type: none">• Transaction fees paid to banks
Banks	<ul style="list-style-type: none">• Operating expenses of maintaining ATM and branch networks• Depreciation of incurred capex on ATM and branch networks• Operating expenses of cash operations	<ul style="list-style-type: none">• Transaction fees paid to other banks and payment networks and intermediaries• Payments to cash logistics companies
Central Bank	<ul style="list-style-type: none">• Costs of printing of currency	<ul style="list-style-type: none">• Losses from counterfeit currency• Currency chest logistics

The “net” economic cost of cash, aggregating costs across stakeholders, is the sum of internal costs borne minus the sum of external payments made, which represent income transfers to other parties, and is therefore subsumed under GDP statistics. Internal costs thus represent foregone opportunities and resources that could have been deployed toward production or consumption, and thereby GDP growth. The following schematic describes the computation (Exhibit 12).

Exhibit 12: Process flow for aggregating costs of cash to the economy



Sources: Internal analysis; Cost and Benefits of Cash and Cashless Payment Instruments: Deutsche Bundesbank, 2014

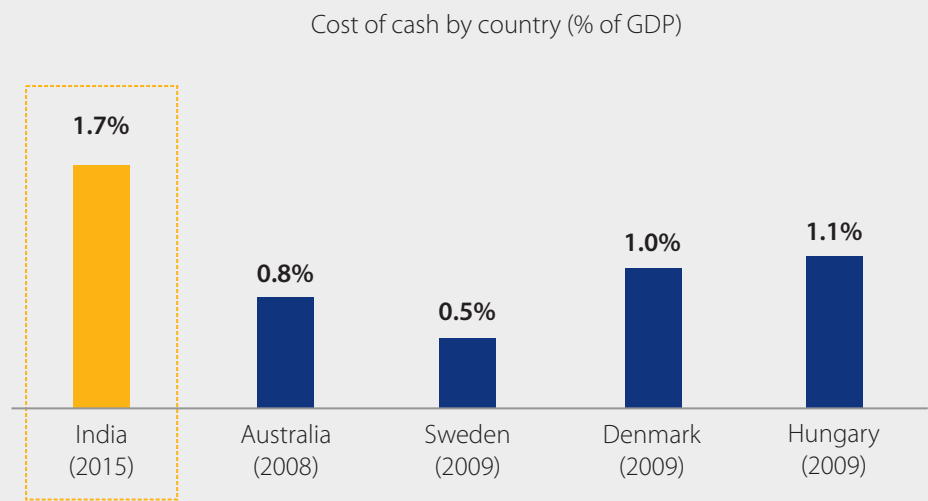
We estimated internal and external components of the cost of cash of the four stakeholders using secondary data sources from the government, the Reserve Bank of India, and industry participants as well as heuristic estimates and proprietary data. Our analysis reveals that significant internal cost, and thereby lost economic potential, is the key factor behind the comparatively higher cost of cash for the Indian economy.

In 2014–15, India’s net cost of cash was 1.7 percent of GDP

India’s net cost of cash – 1.7 percent of GDP – is high when compared with most developed economies. This results from India’s high share of coins and notes in circulation, at 13.6 percent of GDP in 2015, according to the RBI³⁹. Consequently, India’s average number of per-capita card transactions lags behind leading “less-cash” economies. In 2015, India had 10 transactions per capita compared with Brazil’s 163, South Korea’s 420, and Sweden’s 429. (Exhibits 13 and 14).

³⁹ Based on available data on comparable metrics from various central bank studies

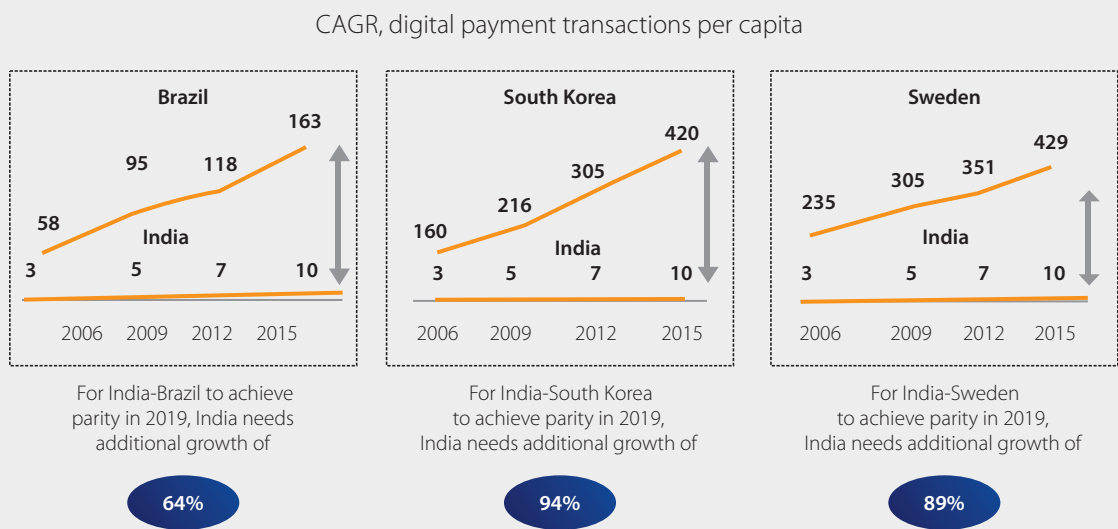
Exhibit 13: At 1.7% of GDP, India incurs a much higher cost of cash compared with most developed economies



Note: For Sweden and Australia, the cost of cash has been computed for cash and card payments. Hungary's estimate includes B2B direct debit and government payments to individuals for pensions in cash, and Australia's cost of cash excludes households.

Sources: Deutsche Bundesbank, Sveriges Riksbank, Danmarks National Bank, Magyar Nemzeti Bank, RBI, European Central Bank, Reserve Bank of Australia; internal analysis

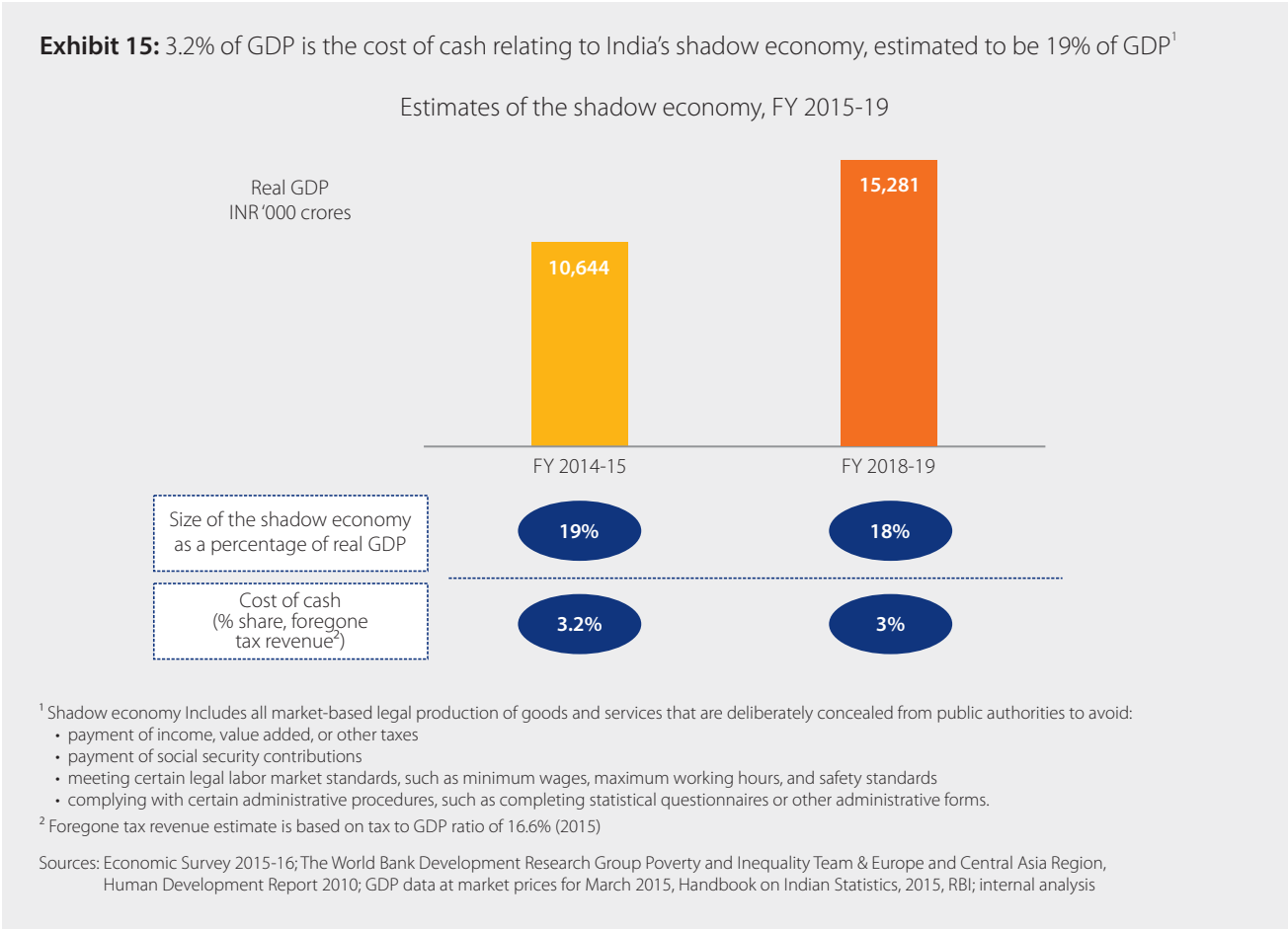
Exhibit 14: To catch up with leading less-cash economies like South Korea and Sweden, India has a long way to go



*Figures from 2013 onward are estimates.

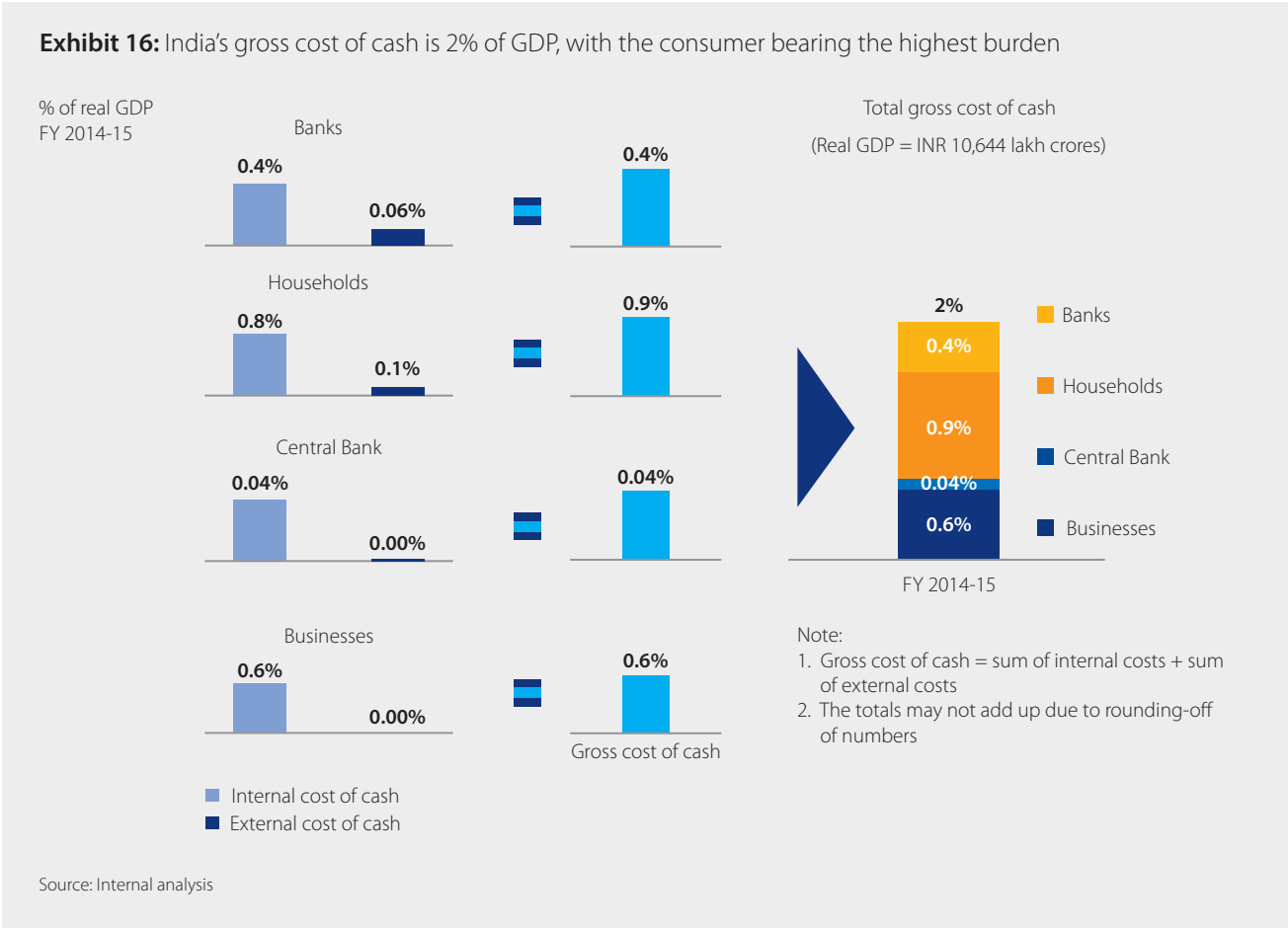
Sources: Statistics on payment, clearing, and settlement systems in the Committee on Payments and Market Infrastructures countries, 2014, Bank of International Settlements; internal analysis

If we include the costs resulting from India's shadow economy, the numbers are staggeringly high. Based on a policy research working paper by the World Bank, "New Estimates for Shadow Economies All Over the World"⁴⁰, we estimate India's shadow economy as roughly 19 percent of GDP. We use this data because of the absence of published national statistics on India's shadow economy. Our analysis suggests that the informal economy costs India about 3.2 percent of GDP in foregone taxes (Exhibit 15).



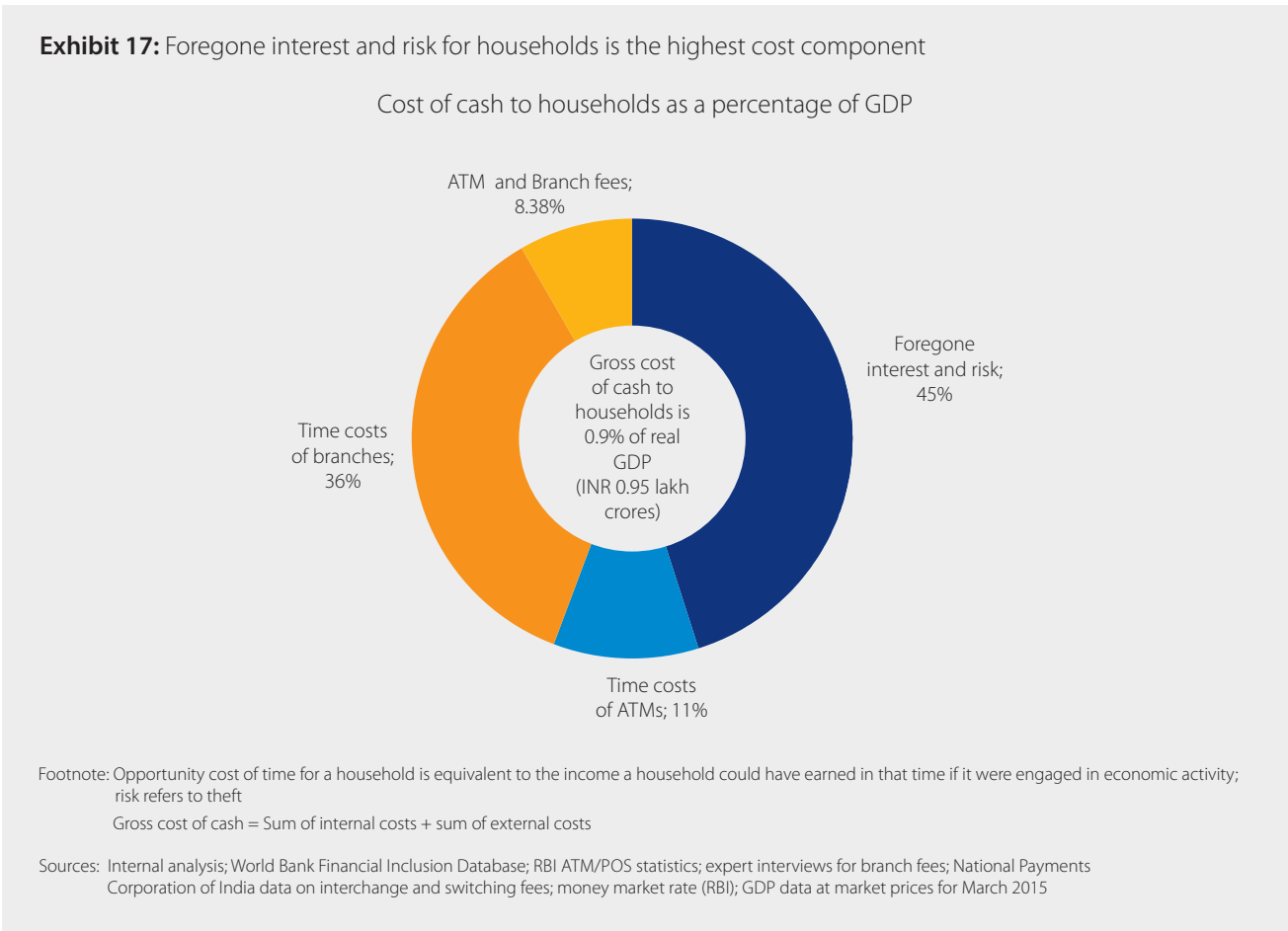
⁴⁰ Policy Research Working Paper 5356; The World Bank Development Research Group Poverty and Inequality Team & Europe and Central Asia Region, Human Development Economics Unit, July 2010

Based on the framework mentioned above, we estimate the cost of cash incurred by each stakeholder group – households, businesses, banks, and the central bank. To fully understand each stakeholder’s cost burden, we analyse the various components of the “gross” cost of cash – that is, the sum total of the internal and external costs. A decomposition of the gross cost of cash shows that households bear the highest gross cost of cash, at 0.9 percent of GDP, followed by businesses, at 0.6 percent, and banks, at 0.4 percent (Exhibit 16). The cost of cash to businesses varies significantly, with micro, small and medium enterprises bearing the biggest burden, at 1 percent to 1.4 percent of GDP. By comparison, the central bank carries the least gross cost, 0.04 percent of GDP. In the rest of this chapter, we look more closely at the cost drivers for the four stakeholder groups.



At 0.9 percent of GDP, the cost of cash is disproportionately high for low-income households

Of India's 258.5 million households, despite more than 50 percent being banked, only about 5 percent of personal consumption expenditure is done digitally. This behaviour points starkly to the high use of cash⁴¹. The cost of cash borne by households broadly comprises the foregone interest and risk for cash holdings and the opportunity cost of obtaining access to the banking system in addition to payment of necessary transaction charges⁴² (Exhibit 17). Given the differences in per-capita GDP between rural and urban India as outlined in the McKinsey & Company report, "India's economic geography in 2025: states, clusters and cities"⁴³, our analysis unambiguously shows that cash places a larger burden on the more vulnerable households. Why is this the case?



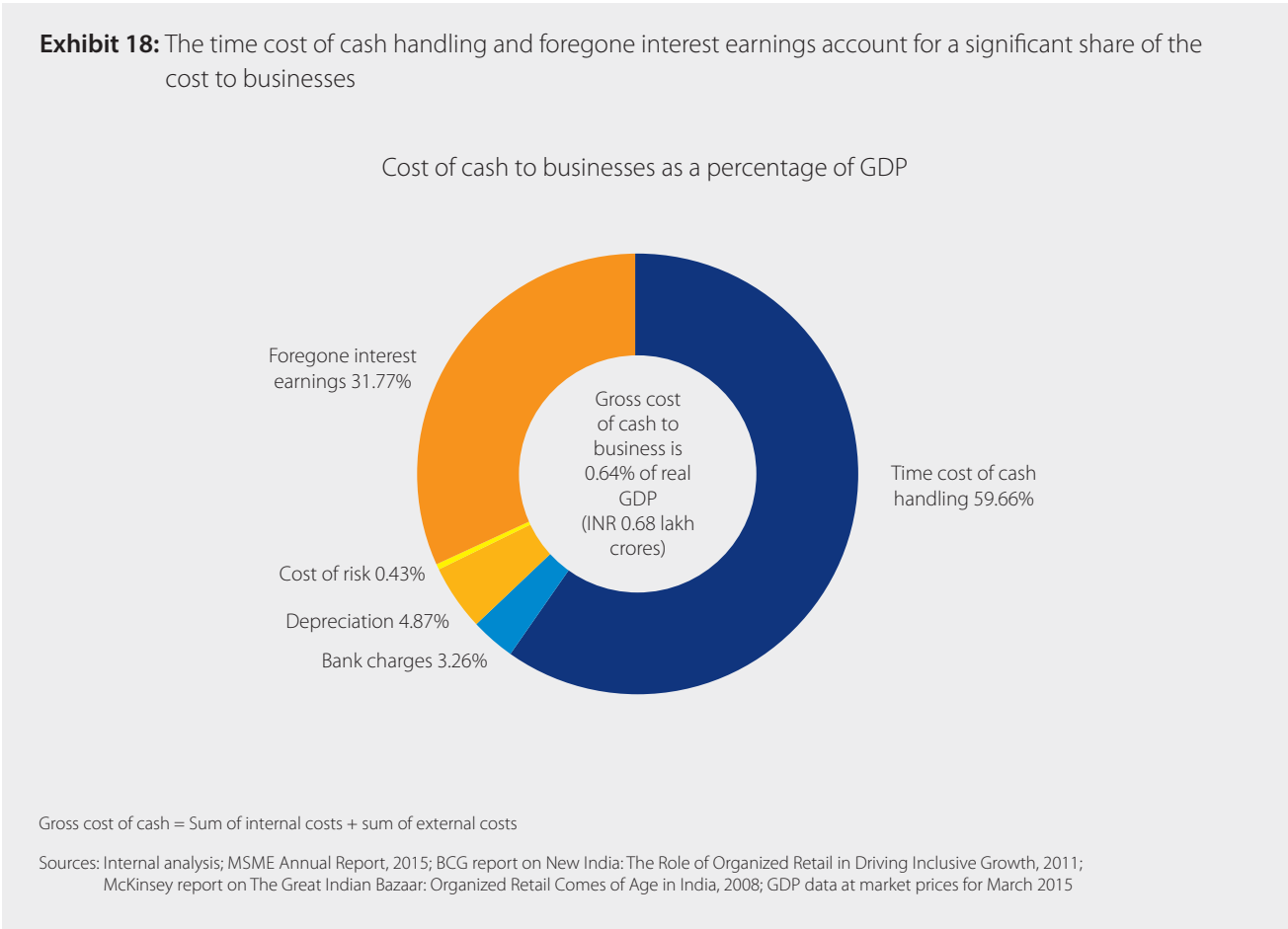
These households keep a large part of their savings in cash. According to the Indian Consumer Economy 360 Survey, 2014, rural households save 22 percent of their disposable income while urban households save 27 percent. Of this, urban-banked households hold 40 percent of savings in cash, and unbanked households hold 90 percent in cash. For rural India, the corresponding numbers are 27 percent and 60 percent, respectively. Savings held in cash mean these households, especially the unbanked, are foregoing interest earnings, as well as running the risk of keeping cash at home. Also, a heuristic sampling of ATM and branch locations shows that an urban household spends about 15 minutes to 25 minutes getting to an ATM.

⁴¹ Census 2011; digital transactions do not include RTGS, net banking, and Automated Clearing House transactions
⁴² Opportunity cost of time for a household is equivalent to the income a household could have earned in that time if it were engaged in economic activity
⁴³ Insights India, McKinsey and Company, 2014, www.mckinseyinsightindia.com

It takes about 60 minutes for households in rural areas to reach an ATM (branches are typically located in district headquarters and the banking correspondents provide services at a taluka or block level)⁴⁴. Similarly, a heuristic sampling of bank branches suggests the average travel time to branches is about 35 minutes to 40 minutes in urban areas and 60 minutes in rural locations. Thus, opportunity costs of time and foregone earnings on cash holdings represent the largest source of costs – 90 percent of the total – for households living away from the urban core.

The highest cost of cash is incurred by micro enterprises at 1.4 percent of GDP while the blended cost is 0.6 percent of GDP for all B2C players

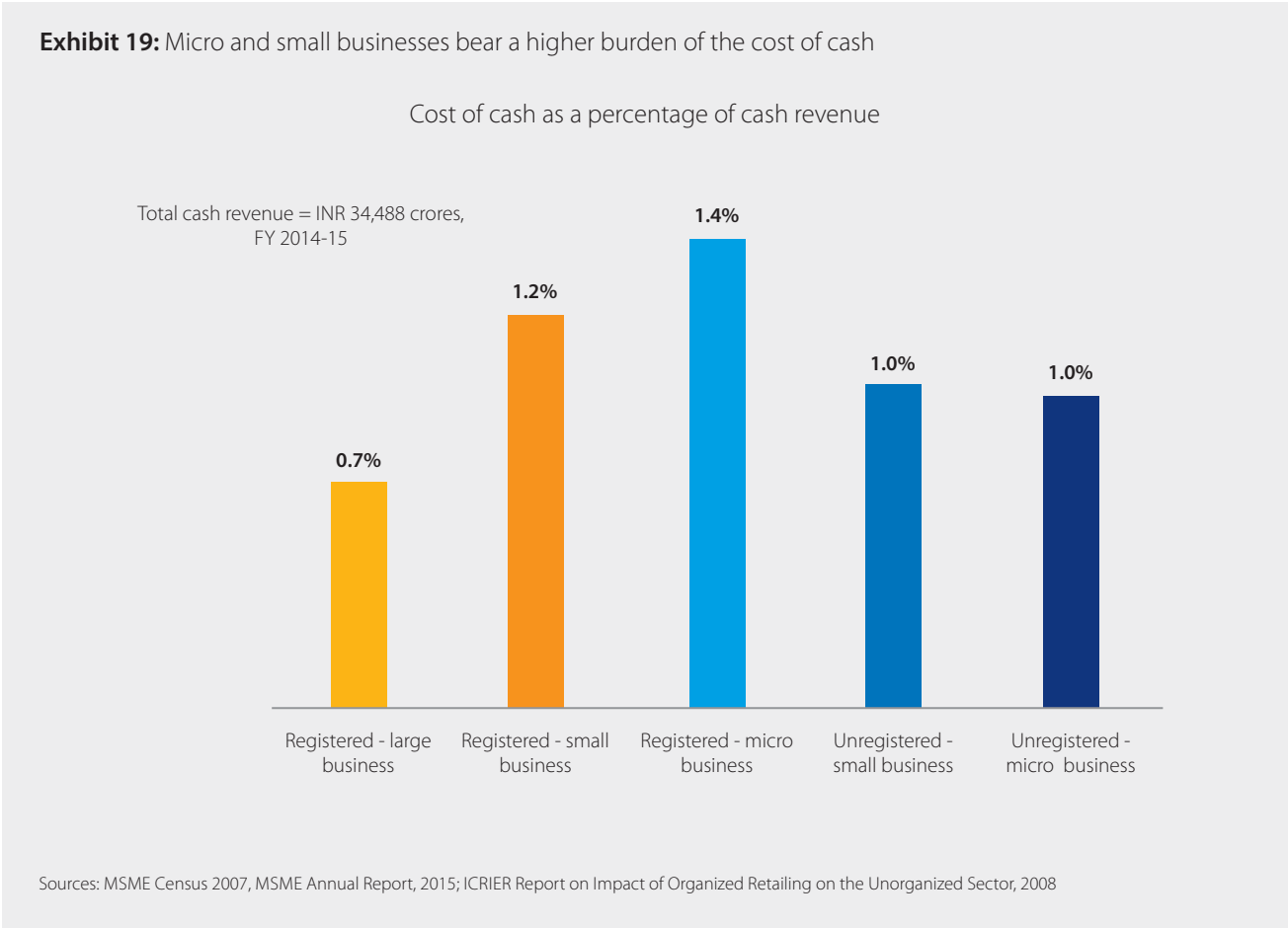
The time spent handling cash accounts – at least an hour a day – constitutes the highest cost of cash for all businesses. The private final consumption expenditure in India is about INR 75 lakh crores (USD 1,114.41 billion) (Exhibit 18). Micro enterprises and SMEs incur an often unnoticed but significant cost of cash (Exhibit 19)⁴⁵.



⁴⁴ Taluka is the next level of administration in a district and comprises a number of villages
⁴⁵ Micro enterprise is classified as one in which investment in equipment does not exceed INR 10 lakhs (USD 14,858.8)

They sell non-discretionary items, typically do many low-value transactions, and are faced with high staff turnover, often as much as 30 percent to 40 percent a year⁴⁶. Consequently, they spend a disproportionate amount of time handling cash – 67 percent of their cost of cash stems from this specific activity. Hours spent managing cash sales means SME staff has less time to pursue more productive activities such as stock-keeping, accounting, and process management. On the other hand, larger retailers, whether physical stores or e-commerce platforms, are concentrated in predominantly Tier 1 cities and much of their customer’s purchases are discretionary, high-value items for which paying cash is less convenient, such as for fashion, jewellery, airline tickets, hotels, and restaurants. Because of the high value and volume of transactions, these merchants often have multiple terminals or channels for payments and relatively better-skilled staff, enabling more efficient acceptance of electronic payments. As a result, the cost of cash for large businesses – 0.6 percent of revenue – is only about half that of the cost of cash for micro, small, and medium enterprises (between 1 and 1.4 percent of revenue).

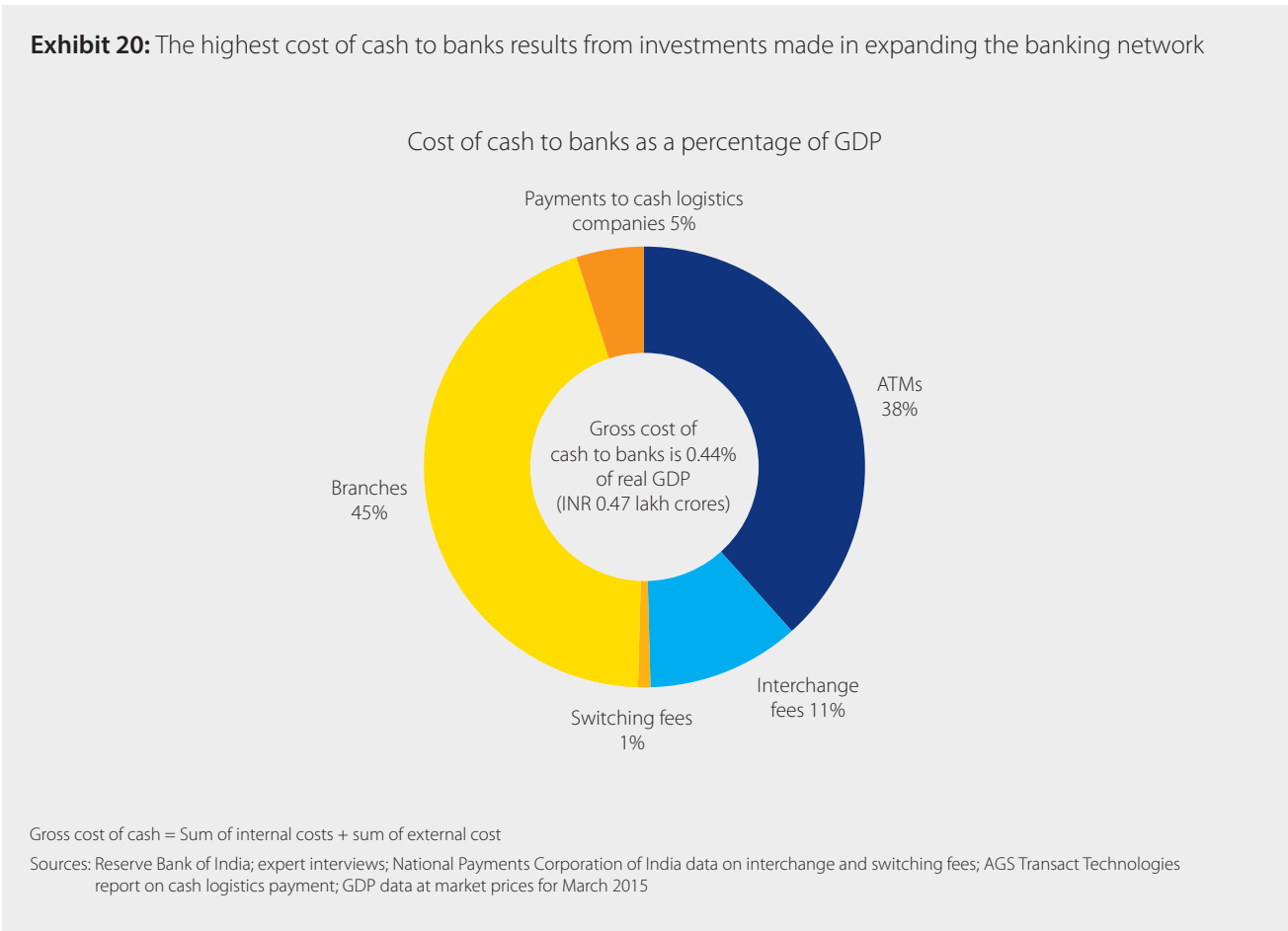
Exhibit 19: Micro and small businesses bear a higher burden of the cost of cash



⁴⁶ Staff attrition increases the complexity and cost of building merchant capacities

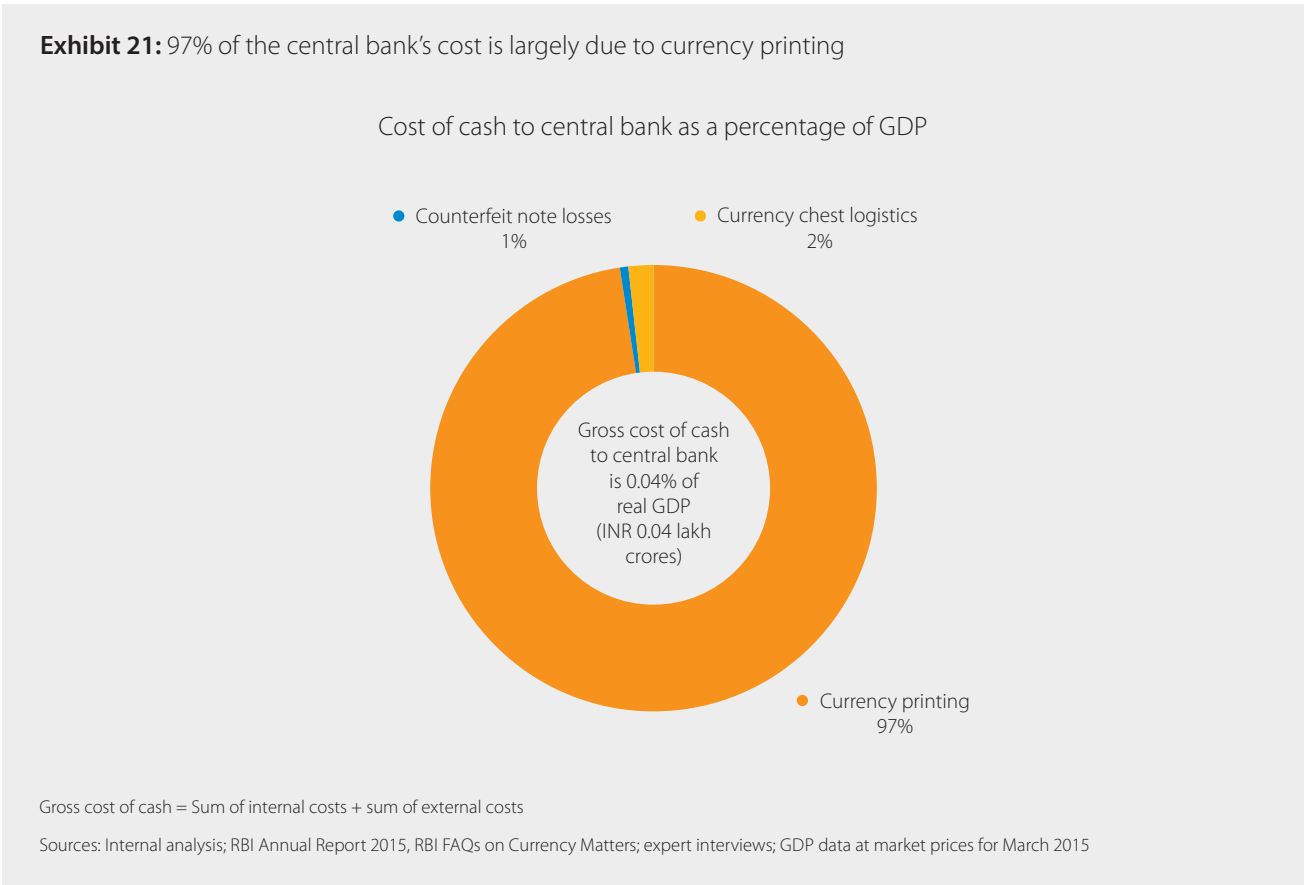
The cost of cash incurred by the banking industry is estimated at 0.4 percent of GDP

Banks incur significant cash-handling costs from managing networks of ATMs, branches, and currency chests. These activities result in loss of interest income on cash holdings in ATMs and branches, payments to cash logistic companies, security, and other infrastructure-related and operational costs. The highest cost stems from foregone interest income from cash holdings in ATMs and branches, followed by payments for cash services (Exhibit 20). According to some recent reports, banks contribute a significant proportion of the revenue of the cash logistics companies in India.



The Reserve Bank of India bears the least cost of cash relative to other stakeholders

As expected, we found that currency printing and management costs account for a disproportionate share – 97 percent – of the central bank’s cost of cash; about 2 percent is incurred for management of the 4,132 currency chests across the country (Exhibit 21). Interestingly, the growth rate of high value currency notes has been far higher than those of lower value; they are easier to hoard and use for payment. Circulation of the INR 1,000 (USD 15) denomination note grew 16.7 percent between 2010-11 and 2014-15, the most of any note, followed by the INR 500 (USD 7.5) note, at 10.2 percent. Circulation of notes of all other denominations grew less than 10 percent during the comparable period.



In summary, managing and securing cash burdens each stakeholder with a different set of costs. Reducing these costs by moving to electronic payments could benefit all stakeholders. To do so, however, requires an understanding of the factors perpetuating the use of cash and crafting suitable policies to address them. The next chapter discusses the challenges of increasing the penetration of electronic payments in India.

Key impediments to the growth of digital payments

As of March 2016, India had about 660 million debit cards in circulation, according to the RBI, and 87 percent of debit card usage at ATMs was for cash withdrawal. For a country of the size of India, the number of credit cards in circulation – 23 million in force – is minuscule, and activation rates of the more than 200 million prepaid payment instruments remain low. This points to the widespread use and, in turn, high cost of cash. An exhaustive analysis of relevant literature and discussions with industry experts highlight six factors that encourage the use of cash. We divide these issues into two buckets for the ease of discussion. The first refers to macro issues like a large shadow economy and the high propensity to save in cash. The second focuses on matters specific to the payments industry.

Macro-level Issues

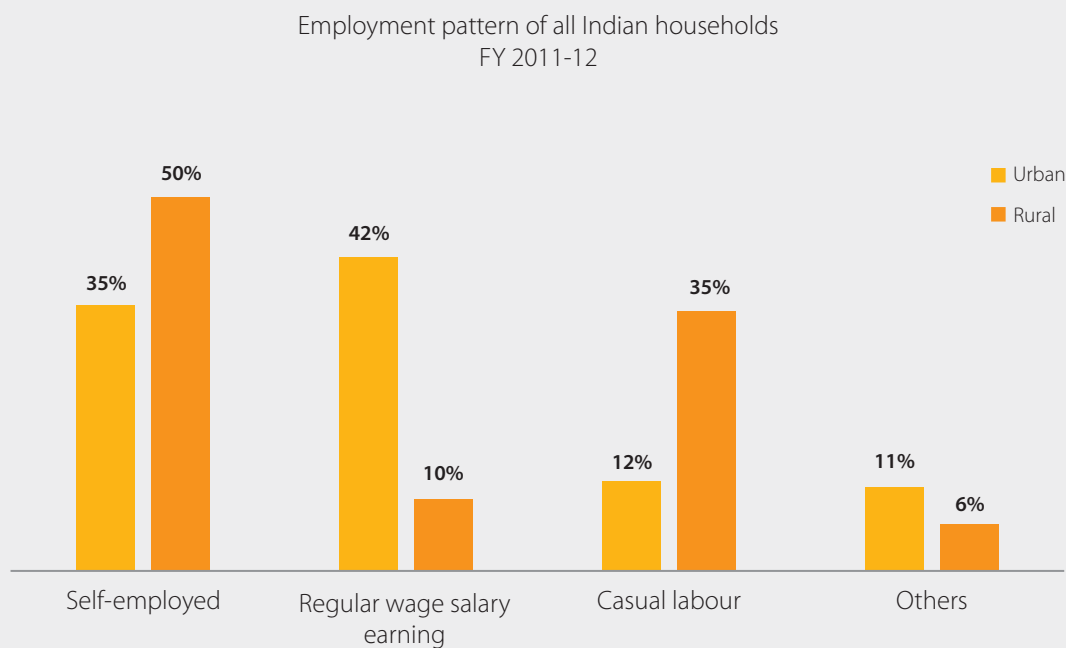
A large informal economy and lopsided labour market, a high propensity to save in cash, and a gender imbalance in the use of financial services are the key macro issues impeding the adoption of digital payments. These are the result of social and cultural factors as well as structural weaknesses in the Indian economy. For example, India has so far paid limited attention to bridging the gender gap. According to Census 2011, the literacy rate for women was 65.5 percent, compared with 82.1 percent for men. Other factors contributing to structural weaknesses in the economy include an underperforming educational system, particularly in vocational training; archaic labour rules; and the absence of policies to promote growth of the formal economy, especially low skill manufacturing. In the rest of this section, we discuss how each of these macro issues undermines the adoption of digital payments.

1. An informal labour market and large shadow economy

The Indian economy is evolving but formalisation remains limited to a few large entities across sectors. SMEs, an important sliver of the country's economic engine, are largely unorganised. Nevertheless, informality is not symmetrically distributed and varies in degree even within sectors. For example, in the retail sectors considered in this report, it ranges from highs of 95 percent to lows of 30 percent⁴⁷. Informality is characterised by a high level of self-and casual employment (Exhibit 22). Some sectors are cash-intensive despite relatively large transaction values, primarily because of the attitude of Indian households toward savings and tax compliance. The red tape associated with India's stringent labour laws has led to widespread use of contract workers in sectors like construction, footwear, garments, and jewellery, all of which make daily or weekly cash-based wage payments. Further, the lack of suitable employment opportunities in general results in many rural migrants working as help in urban households. Businesses often pay such workers in cash and in kind, for example through medicines, personal care products, and housing.

⁴⁷ Analysis based on Visa data on card spending patterns in 2014 and industry reports on the size of the organised retail sector: Technopak advisors, ICRIER, and IBEF

Exhibit 22: High level of part-time, casual, and contract labour make households’ earnings fragmented, infrequent, and cash-intensive



Note: Others refers to households without any income from economic activities, and includes part-time workers
Source: Employment and Unemployment situation in India, National Sample Survey 68th round, 2011-12

As a result, a large, informal credit ecosystem based on cash thrives in the economy – 28 percent of all household credit (with 44 percent in rural areas alone) is derived from the informal sector, amounting to INR 6.4 lakh crores (USD 95.1 billion) in cash-based, person-to-person transfers⁴⁸. Only 8 percent of Indian households have wages directly deposited into bank accounts and only 42 percent have regular wage-earning employment, according to the World Bank and National Sample Survey Organisation. These figures suggest that a large number of employees are paid salaries and wages in cash, and that a major portion of this money fails to enter the financial system.

A large remittance-based economy

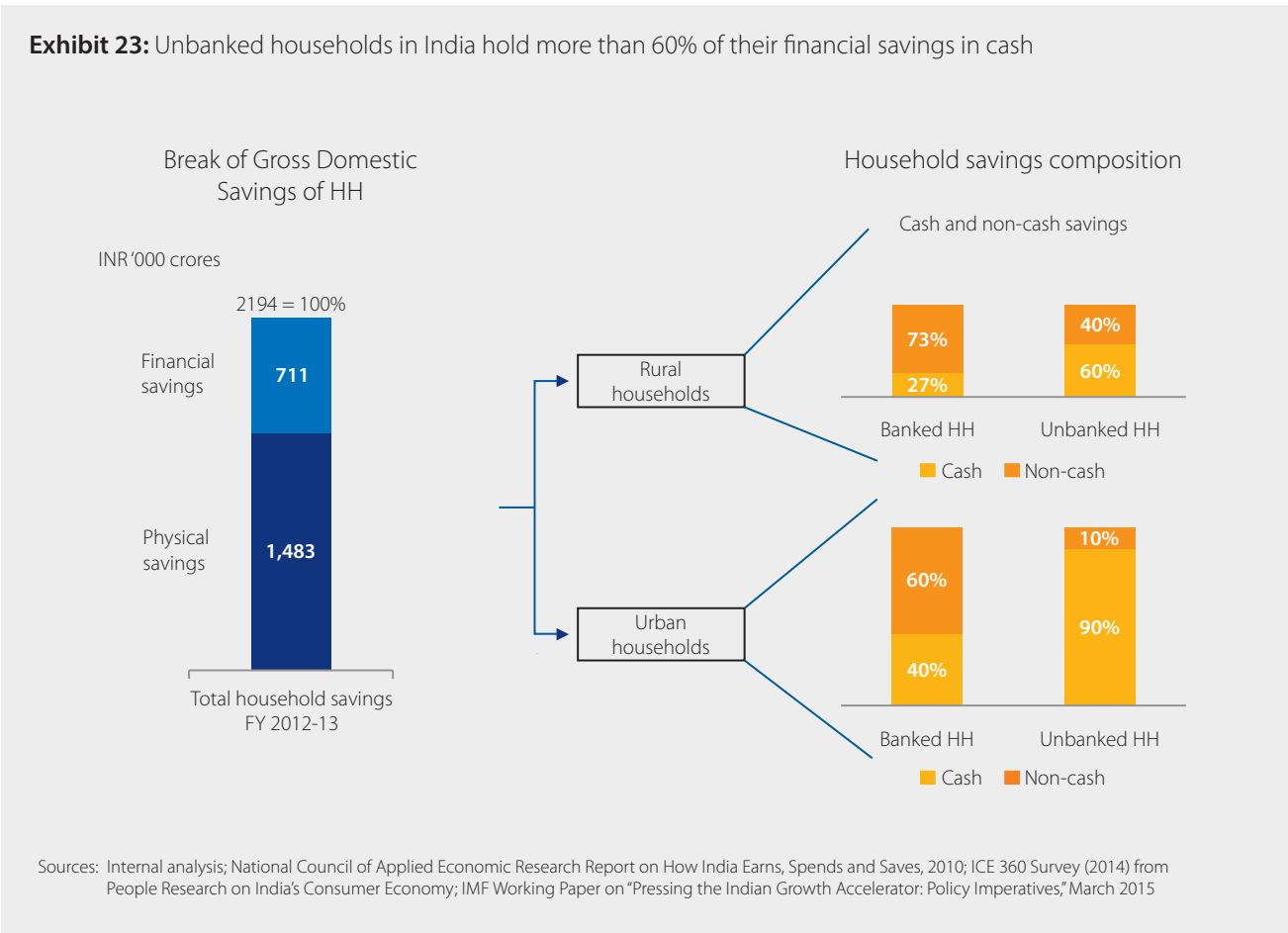
Lack of suitable employment opportunities in India has led to an increasing migrant population and resulting remittance flow. Many Indians have migrated overseas in search of better work prospects, while others have relocated from rural to urban areas. In fact, India is one of the largest remittance markets in the world. It was the biggest recipient of cross-border inbound remittances in 2015, with more than USD 70 billion received⁴⁹; domestic remittances are estimated at USD 9 billion⁵⁰. Studies have shown that the primary use of remittances, both international and domestic, is for support of the migrant’s family in his or her place of origin. More than 60 percent of remitted funds are for day-to-day spending⁵¹, and the assumption is that most of these transactions are cash-based.

⁴⁸ NSSO 70th Round, (2014), Key Indicators of Debt and Investment in India
⁴⁹ World Bank Bilateral Remittance Matrix, 2014
⁵⁰ Das, A. (2012). Including the Poor: Need for Reforms in Remittances, IIT Bombay
⁵¹ NCAER. (March 2014). National Remote Payments Survey

2. A high propensity to save in cash

Cultural, traditional, and historical factors influence the financial behaviour of Indian households. These include an emphasis on prudence; a societal need to display material well-being; relative faith in state authority; high level of aspirational goal-setting; strong preference for stability backed by physical assets; and a stigma against indebtedness and financial distress. Such cultural factors may help explain the often-contradictory patterns of household spending in India.

Indian households hold a majority of their wealth in physical assets like real estate and gold; however, even given limited financial assets, cash has a predominant place (Exhibit 23). Transactional, precautionary, and saving motives can explain the marked preference for liquid resources⁵². Historical and economic experience has led Indians to take financial precautions and pursue self-reliance to protect themselves against unanticipated expenses. Even compared with other emerging markets, Indians’ affinity for holding cash and physical assets is striking, making it an interesting area for further exploration as well as targeted digitisation.

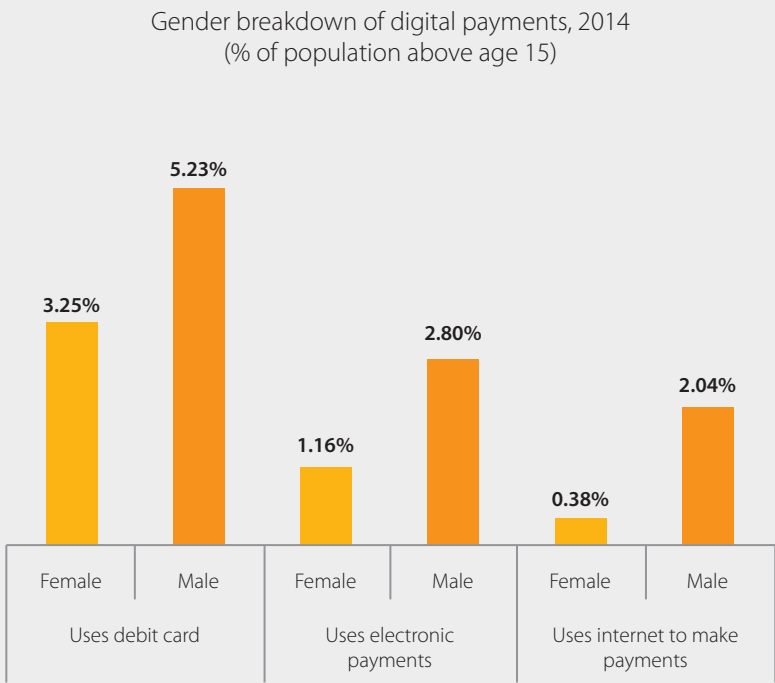


⁵² This is based on classical demand theory that is widely accepted by economists

3. A gender imbalance in the use of digital payments

The gender divide in adoption of financial services is staggering. The marginalisation of women in financial decision-making and the labour market has alienated them from the financial system (Exhibit 24). The participation of women in the financial system and the labour force drops off sharply with an increase in the level of household income. Observational evidence suggests that in a largely patriarchal society, the majority of middle-class and upper-income households are male-led, with the family's financial needs serviced mostly by a single bank account funded and managed by the male head. This person dispenses cash to other family members as needs dictate; the arrangement includes women, who typically make the majority of household transaction decisions. Families where women tend to be the major breadwinners are also generally the poorest families. In these cases, women earn meagre amounts while working multiple informal jobs in the agriculture or services sectors. The microfinance industry actively targets these segments, but the rest of the formal financial system typically neglects women. Thus, a large portion of the population is effectively excluded from the financial system and thereby, digital payments.

Exhibit 24: Use of electronic payments by women is much lower than by men



Source: World Bank Financial Inclusion Database, 2014

Industry-specific Issues

Discussions with industry participants, especially with banks that have been at the forefront of digital payments in the country, surfaced three barriers to progress: the high cost of acceptance infrastructure, some regulatory limitations, and an insufficient focus on financial literacy. Appropriate regulatory intervention could address all three issues.

4. High cost of acceptance infrastructure

The cost of a point-of-sale (POS) terminal in India ranges from INR 8,000 (USD 118.9) to INR 12,000 (USD 178.3); countervailing duties and taxes account for about 20 percent of the price. In addition, the annual operating cost is INR 3,000 (USD 44.6) to INR 4,000 (USD 59.4) per terminal⁵³. That covers paper and servicing costs, amounting to about INR 3.9 billion (USD 0.06 billion) annually for all installed 1.3 million terminals⁵⁴. Additional costs include those to build merchant and acquirer capabilities. A high rate of staff attrition at merchants of 30 percent to 40 percent a year makes the process of capacity building onerous for all parties involved. Finally, low transaction values and volumes at smaller merchants, especially outside of Tier 1 cities, make it unviable for banks to expand their footprint into such segments⁵⁵.

5. A regulatory limitation

Instruments such as Real Time Gross Settlement (RTGS), National Electronic Fund Transfer (NEFT), and Immediate Payment Services have contributed to the digitisation of payments. These alone are insufficient. In September 2012, the RBI introduced a cap on the merchant discount rate (MDR) on debit card transactions. This essentially reduced the MDR in the market by 50 percent and also resulted in the interchange fees paid to the issuing bank being reduced correspondingly. The RBI capped the MDR at an ad-valorem rate of 0.75 percent for debit card transactions below INR 2,000 (USD 29.7) and 1 percent for transactions above INR 2,000. It was envisaged that this cap would increase the acceptance infrastructure and grow debit-card transactions and usage exponentially. However, between October 2013 and October 2015, the number of ATMs and point-of-sale terminals grew only 19 percent and 13 percent, respectively, according to the RBI. In contrast, the acceptance network grew 27 percent between October 2011 and October 2012, with ATM locations increasing 22 percent and the number of POS terminals rising 28 percent (Exhibit 25)⁵⁶.

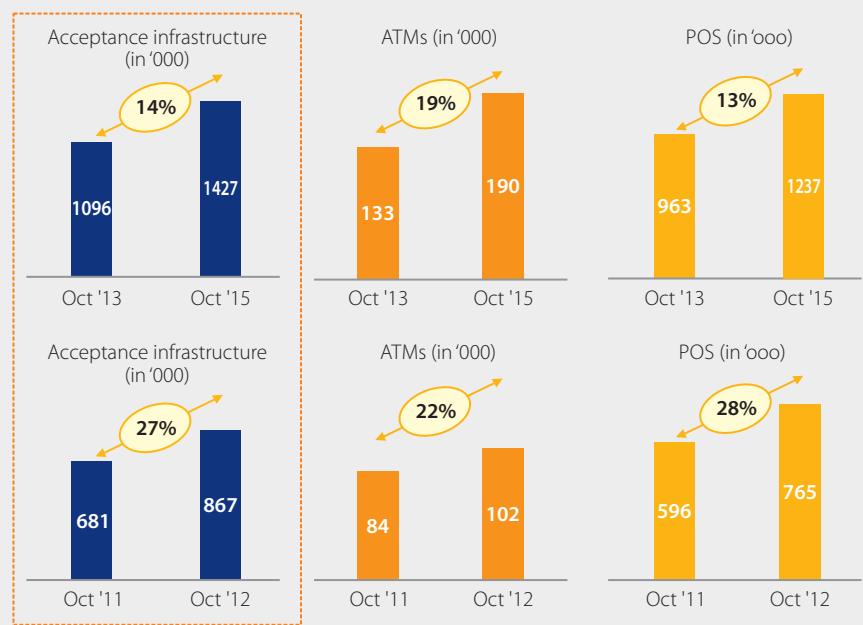
⁵³ Industry interviews including banks and suppliers of point-of-sale terminals

⁵⁴ RBI: Concept Paper on Card Acceptance Infrastructure, 8 March, 2016

⁵⁵ Expert interviews

⁵⁶ RBI: Concept Paper on Card Acceptance Infrastructure, 8 March, 2016

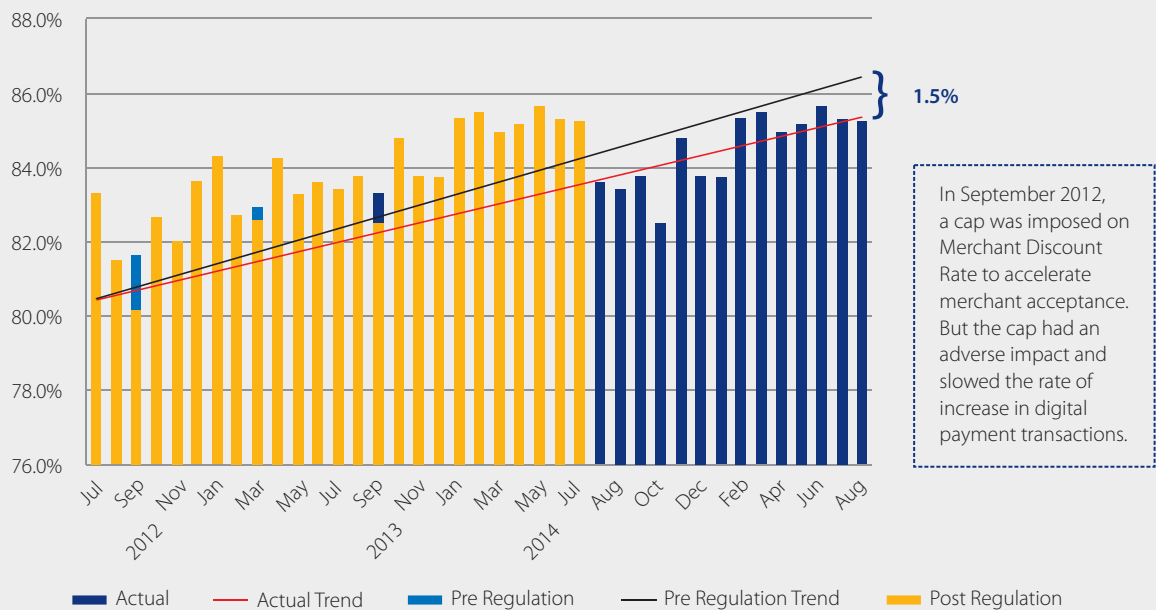
Exhibit 25: Growth of acceptance infrastructure has slowed over the years



Source: Concept Paper on Card Acceptance Infrastructure, Department of Payment and Settlement Systems, Reserve Bank of India, March 2016

Further, the growth rate of debit card transactions actually slowed following the implementation of the MDR cap guideline (Exhibit 26).

Exhibit 26: Growth of low-value transactions on debit cards has been lower than the pre-regulation trend



Source: Visa

This cap on debit card MDRs hurt the profitability of the entire acceptance industry and, in turn, reduced the incentive to invest in acceptance infrastructure, namely terminals and distribution expansion. Owing to this, the acquiring business is most often seen only as a strategic asset within banks to help add current accounts of merchants or find customers for the lending business rather than a stand-alone business unit. Additionally, the MDR on small-value transactions is so low that banks find them untenable. In hindsight, the cap on the debit card MDR has predominantly benefited large merchants without any significant increase in debit card transactions.

The MDR reduction cost the banking industry an estimated INR 7.50 lakh crores (USD 110 million) in revenue in the latest fiscal year, according to an industry estimate as of June 2016. As a result, banks have pulled back on reward programmes and other incentives that are typically offered to get consumers to shift to electronic payments.

6. Insufficient focus on financial literacy

According to the RBI's Financial Inclusion Report 2015⁵⁷, more than 50 percent of Indian adults held an account with a financial institution, compared with nearly 70 percent of adults in the BRIC countries. According to the Prime Minister Jan-Dhan Yojana (PMJDY), 242 million accounts have been opened since the launch of this flagship programme⁵⁸. However, dormancy rates of bank accounts remain high. The statistics show that dormancy rates dropped from 43 percent⁵⁹ to 28 percent⁶⁰ following the rollout of PMJDY, but much of this decline reflects disbursements of government subsidies into bank accounts. Digital payment of subsidies is a good start but a long road remains ahead for widespread use of digital payments. For example, monthly inflows of subsidies to bank accounts become withdrawals from ATMs through the Bank Mitra, perpetuating the cash-dependent economy. A study by Micro Save, "Assessment of Bank Mitras (BMs) Under Pradhan Mantri Jan Dhan Yojana⁶¹", showed that a lack of financial literacy is one of the main reasons for this phenomenon. In addition, the report stated that "Dormancy in accounts can mostly be attributed to factors such as lack of information on operational procedures, product features, and opening of duplicate accounts". Further, a study by CGAP⁶² in India and Indonesia showed that while the demand for financial education is quite high, financial training sessions have not been as effective as desired. Efforts to improve financial literacy are fragmented – for example, microfinance institutions, non-governmental organisations, and a few government-owned institutions like the National Bank for Agriculture and Rural Development all run such programmes. The absence of coordinated large-scale, nationwide efforts to bolster financial literacy, thereby supporting expansion of the financial system, is problematic. Countries like Indonesia and Uganda have undertaken successful national efforts in this area.

To summarise, the interplay of macro and industry-specific issues have constrained the development of the digital payments industry. In the next section, we propose policy levers that we believe could help address a majority of these issues.

⁵⁷ RBI: "Report of the Committee on Medium-term Path on Financial Inclusion," December 2015

⁵⁸ As of 13 September, 2016

⁵⁹ World Bank Financial Inclusion Database 2014, "No deposit and no withdrawal transaction in the past year (for % of population with a bank account and 15+ years of age)"

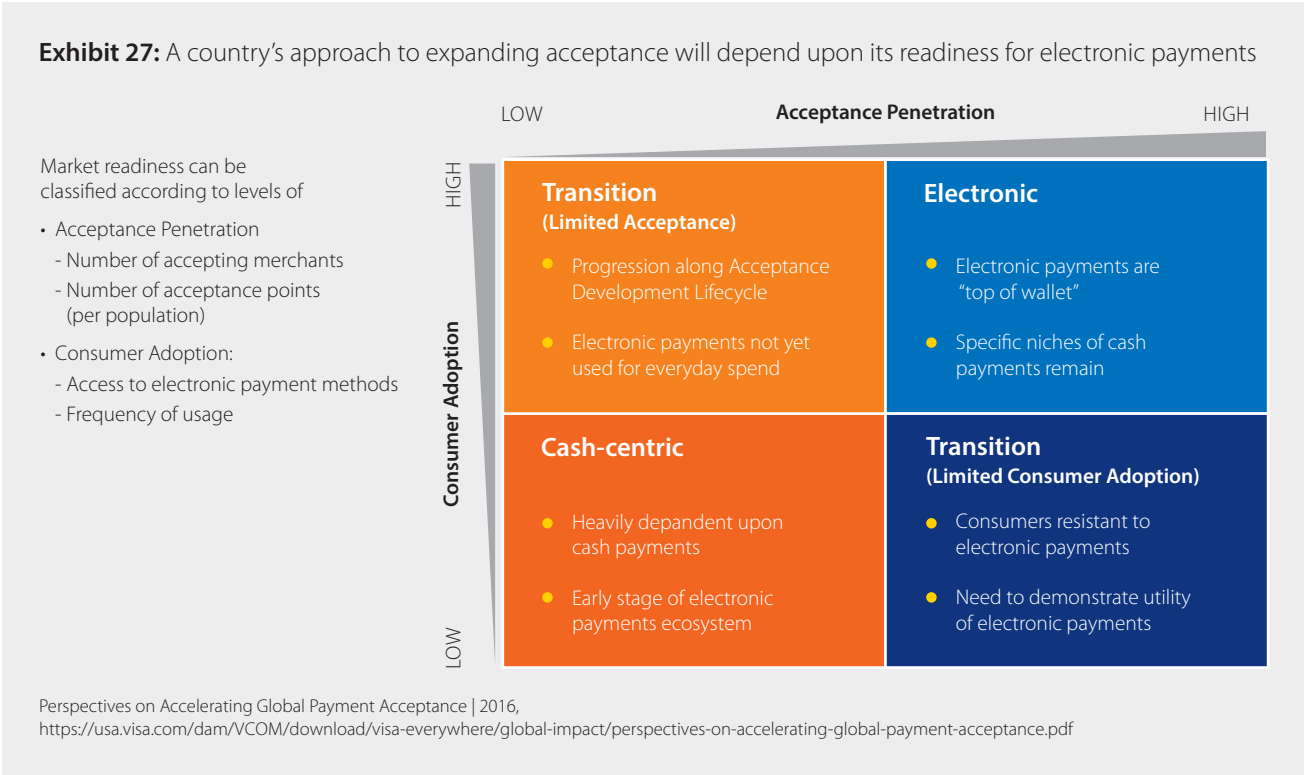
⁶⁰ MicroSave, "Assessment of Bank Mitras (BMs) Under Pradhan Mantri Jan Dhan Yojana – Wave III," January 2016

⁶¹ *Ibid*

⁶² "Prices or Knowledge? What Drives Demand for Financial Services in Emerging Markets?", Sawan Cole, Thomas Sampson, Bilal Zia, CGAP 2011

Three pillars
to accelerate the adoption
of digital payments

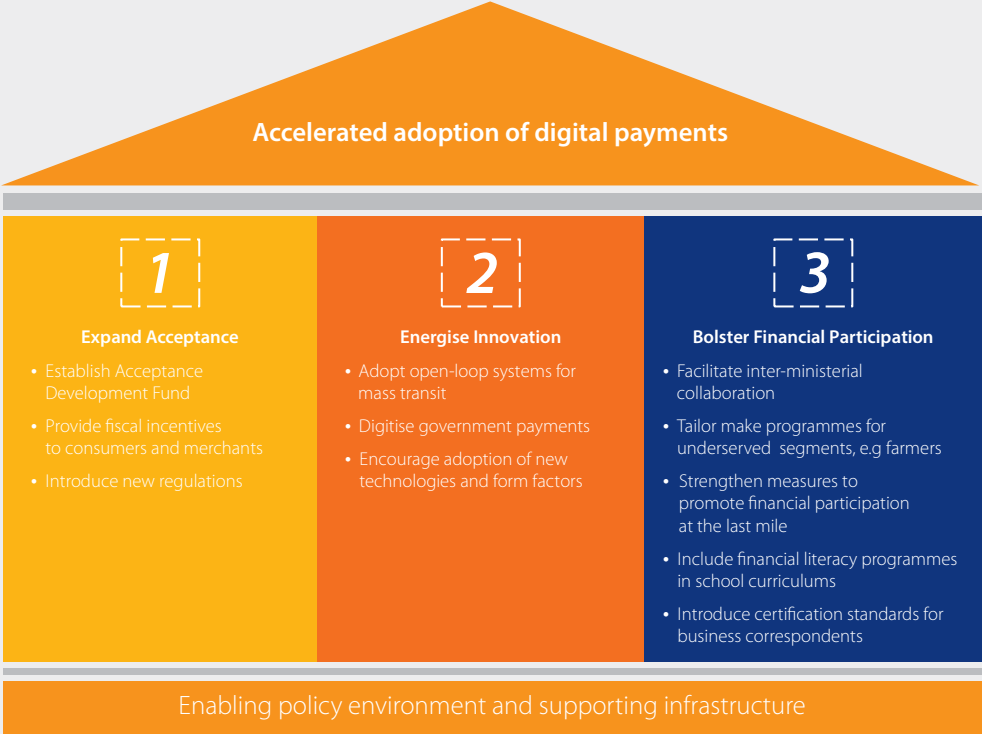
With an installed base of 1.3 million point-of-sale terminals and about 5 percent of personal consumption expenditure incurred digitally, India is in transition on the two fronts of consumer adoption and acceptance penetration (Exhibit 27)⁶³. Based on our global experience and detailed understanding of domestic market requirements, we believe a concerted effort to expand acceptance, energise innovation, and bolster financial participation could expedite the adoption of digital payments.



Expanding acceptance requires introducing and following through on a series of legislative, policy, and fiscal measures. Also, emphasising innovative methods to pay and be paid is required. Adopting open loop payment systems for transit, introducing government procurement and disbursement cards, and diffusing innovations like near field communication technology and mobile-based payment solutions, are some measures to consider. Lastly, bolstering existing efforts to increase participation in the financial system using global best practices would be beneficial. Action in these areas, coupled with attempts to create the enabling infrastructure and environment by tapping into flagship programmes like Make in India and Digital India, could accelerate the adoption of digital payments (Exhibit 25). This chapter elaborates on each of the three pillars.

⁶³ Digital payments in this case does not include RTGS, Net Banking, and Automated Clearing House transactions

Exhibit 28: Focusing on three pillars could help India accelerate its shift to a less-cash society

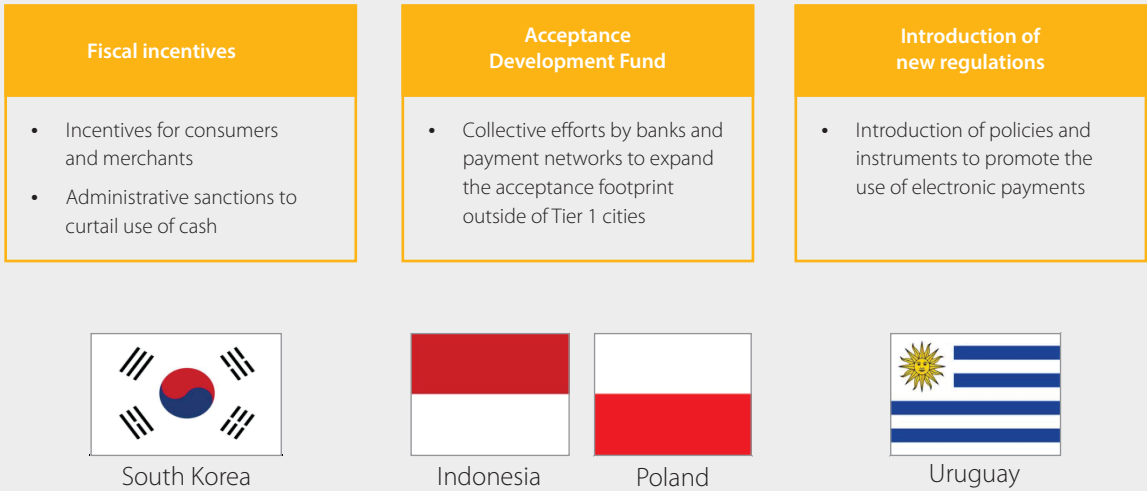


Source: Internal analysis

1 Expand Acceptance: Introduce and implement a package of measures

Global experience suggests that the government and the central bank must work together to promote and increase the penetration of digital payments. Collective action in the form of establishment of an acceptance development fund, fiscal incentives together with administrative sanctions, and innovative government regulations have been successful in several countries, including Brazil, Indonesia, Malaysia, Poland, South Korea, and Uruguay (Exhibit 29). In this section, we elaborate on such measures and propose specific recommendations for India.

Exhibit 29: Globally governments and central banks have undertaken various measures to accelerate electronic payments



Perspectives on Accelerating Global Payment Acceptance, Visa, April 2016
<https://usa.visa.com/dam/VCOM/download/visa-everywhere/global-impact/perspectives-on-accelerating-global-payment-acceptance.pdf>

A) Launch an industry-wide acceptance development fund

Establishing an acceptance development fund (ADF) can aid the expansion of the acceptance infrastructure for card payments. Indonesia, Malaysia, and Poland have already done so. Different stakeholders in the digital payment value chain typically come together to set up an ADF. In Indonesia, Visa played an active role in establishing and managing the Indonesia Acceptance Fund (IAF) that began in 2011. The fund was capitalised by issuing banks contributing three basis points of their quarterly payment volumes on Visa cards. About USD 30 million has been collected and distributed over the last five years. The main objective is building and improving the payments acceptance ecosystem, and the impact has been significant. The number of POS terminals in Indonesia has risen from 250,000 in 2011 to 800,000 in 2016. The funds were used in the following ways:

1. 40 percent for expanding the acceptance network geographically
2. 15 percent for developing new acceptance channels, for example, mPOS and NFC enabled terminals
3. 30 percent for expanding merchant segments such as fuel and public transport
4. 15 percent for improving acceptance quality, including the launch of the Visa Acquirer Academy, to continuously improve the skills of the merchant acquiring institutions and their staff members

Poland established an ADF in 2009, and pools funds from card issuers for the deployment of new POS terminals primarily outside Tier 1 markets. The programme has financed more than 120,000 terminals, leading to 98 percent growth in the value of consumer card payment transactions from 2009 to 2014. Cash payments grew by a mere 4 percent during this time.

Establish an India Acceptance Development Fund

Establishing an India Acceptance Development Fund would take the nation many steps forward in its digital payments journey. India has suitable pre-conditions for such an initiative:

- *Large base:* India has a large, untapped issuance base. Recently, 220 million new accounts were opened while millions remain unbanked. As of March 2016, over 660 million debit cards and 24.5 million credit cards had been issued. However, activation rates of debit and credit cards at merchants is less than 10 percent and 40 percent, respectively.
- *Low penetration of personal consumption expenditure (PCE):* Only 12 percent of transactions (as a percentage of PCE), including 4 percent on cards, are conducted without cash. Card penetration in India is far lower than that of other economies such as Brazil, China, and South Korea – 54 percent, 31 percent, and 54 percent respectively⁶⁴.
- *Proactive:* Banks issue debit cards at the time of account opening.
- *Innovation:* Banks are innovating in issuance and acceptance, including a business correspondent model to provide last-mile connectivity to cardholders in remote areas, the impending launch of the Payments Banks, and proliferation of no-frills accounts.

India could add as many as 2.7 million acceptance points across the country with an investment of INR 1,000 crores (USD 153 million) by issuing banks over the next five years⁶⁵. The Reserve Bank of India has been working expeditiously on such an industry-led fund over the past several months.

In addition, the government could consider reducing the import duties on POS machines to 5 percent and provide incentives to stimulate domestic manufacturing of point-of-sale terminals. Outlined below are the broad contours for the establishment of such a fund.

Governance: An India Acceptance Development Fund could be established as an independent, inclusive, and autonomous body responsible for growing acceptance at scale. The initiation of this body could begin with the establishment of a steering committee with participation from key issuers, acquirers, and all card payment networks and representation from the RBI. The RBI could appoint the chair of the steering committee. The steering committee could agree on appropriate governance structures for the fund, and seek expert external advice as appropriate.

Capitalisation of the fund: The fund could be established with a minimum corpus of INR 1,000 crores (USD 153 million). These funds would flow from issuing banks; each bank's contribution could be one to three basis points of the payment volumes of debit and credit cards, respectively. The rationale for tapping into payment volumes is to ensure that issuers with a large number of inactive cards are not further burdened with additional costs. The contribution could be deducted at the source during the interchange settlement process, and the payment networks could facilitate setting up this process. The proceeds could be credited in an escrow account and deposited with the RBI.

Disbursement of the fund: These funds would be used to increase digitisation of payments in under penetrated non-discretionary segments such as utilities, healthcare, and groceries. Further, the governing body of this fund could evolve specific criteria to disburse funds post-deployment. A certain portion of the funds could also be used to build merchant capacity through training and education programmes.

Our experience suggests that best practice is to set up a mechanism to distribute the grant to eligible claimants after deployment. This would require acquirers to complete the necessary processes to secure the grant; the steering committee would have the right to audit as required. Equally necessary would be using a modest share of fund money – for example, 10 percent – to conduct awareness-building programmes.

Various stakeholders are supportive of this initiative. Implementing such a policy measure would benefit and help accelerate the growth of the payments industry, making it a win-win proposition for all – the government, the RBI, and the banking industry.

⁶⁴ Refers to numbers of cards issued and activation rate

⁶⁵ The number of POS terminals could be even higher if India makes a substantive shift to mobile-based payment solutions

B) Provide fiscal incentives and introduce new regulations

Over the last few years, India has undertaken measures to begin the shift to a less-cash society (Exhibit 30). However, single-digit debit card activation rates and a large shadow economy warrant the need for continued intervention by the Government of India. This issue is not unique to India, however. Countries regularly face such challenges in their development journeys and some, most notably South Korea and Uruguay, have overcome hurdles through government intervention.



South Korea:

In the 1990s, the South Korean Government adopted several measures to promote the growth of electronic payments. As a result, the country significantly reduced the size of the shadow economy, improved financial transparency, and increased tax revenue. These measures included:

- *Tax rebates to consumers:* When the scheme was introduced in 1991, an individual’s deductible income was set at 10 percent of the amount greater than 10 percent of the person’s total income, capped at KRW 3 million, or about USD 3,000. For example, for someone with income of USD 100,000 and USD 20,000 in credit card spending, USD 10,000 is deemed deductible. Deductions are capped at USD 3,000. At the end of 2015, 15% of the amount of credit card spending greater than 25% of the person’s total income, and 30% of the amount of debit card spending greater than 25% of an individual’s income, combination of these two capped at KRW 3 million is deemed deductible.
- *Incentives to merchants:* For this cohort, two incentives exist. One is a credit-card-sales tax relief scheme. Under this programme, the government increased the tax credit rate from 1 percent to 2 percent to encourage active use of credit cards for commercial transactions. A second incentive is a tax deduction based on an increase in sales. In this instance, an increase in the amount paid through credit cards in the relevant taxation year, relative to the previous year, is deducted from the tax due. The amount would be 50 percent (the limit) of increased credit card payments times the share of credit-card sales in total income. Let’s say a merchant generated USD 100,000 in annual revenue in 2016. It turns out that sales completed by credit or debit card rose by USD 10,000 from 2015 (for example, from USD 70,000 to USD 80,000). Then, 50 percent of that increase is deductible from the annual sales subject to sales tax. So the merchant would be allowed to deduct USD 5,000 (10,000 * 50 percent) from USD 100,000, leaving his taxable revenue at USD 95,000.

- *Administrative sanctions:* Two measures were introduced to ensure systematic compliance. First was the levy of a 5 percent tax penalty on merchants who refused to issue credit card slips. Second, individuals reporting merchant non-compliance are entitled to a reward of KRW 10,000 for a transaction refused with a value between KRW 5,000 to KRW 50,000. For transactions between KRW 50,000 and KRW 250,000, the reward amount is 20 percent of the transaction value; for transaction values of more than KRW 2.5 million, the amount is capped at KRW 50,000.
- *Ease in citizen-to-government payments:* Since 2015, business owners have had the option of paying their national taxes by credit card.
- *Other measures from the mid-1990s:* The government used credit card slips as lottery tickets. Monthly draws were conducted and the first prize was about KRW 1000 million. The government discontinued this incentive when people drastically reduced the size of their transactions so that they could generate more slips per consumer. Another big step was the mandate to use credit cards for entertainment expenses of more than KRW 50,000. This mandate has been enhanced as of 2016. Entertainment expenses over KRW 10,000 (approximately USD 10) can be reported to be corporate expenses subject to tax deduction only when incurred on corporate credit or debit cards.

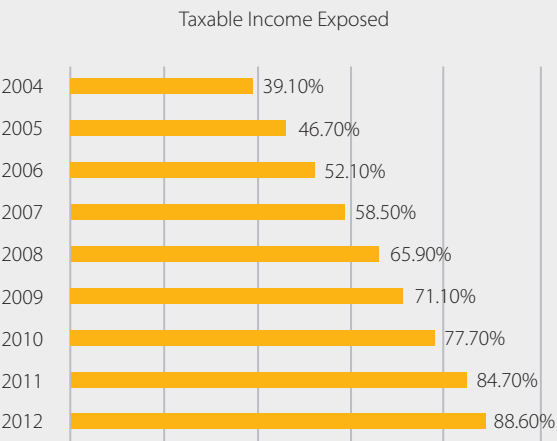
Impact: The South Korean economy has gained significantly from the sustained implementation of these measures. The proportion of taxable income exposed through credit card transactions and cash receipts rose by 5 percent to 7 percent a year, reaching 88.6 percent in 2012, from 39.1 percent in 2004 (Exhibit 31), according to a 2013 report from the National Tax Service of South Korea.

Exhibit 31: South Korea introduced a series of fiscal incentives for consumers and merchants

Highlights of policy measures introduced

- **Tax rebates to consumers:** A maximum tax rebate of USD 3,000 per capita per year on annual taxable income
- **Incentives to merchants:** VAT deduction based on credit card sales; introduced credit card sales tax relief. Increased the tax credit rate from 1% to 2% , product or service directly to end users, including retail, restaurant and accommodation, etc.
- **Tax deduction based on an increase in reported income:** To improve transparency in commercial transactions, the eligible amount would be 50% (the maximum limit) of increased credit card payments
- **Administrative sanctions:** Levy a 5% tax penalty on merchants who refuse to issue credit card slips. Reward individuals for reporting non-compliance of merchants, capped at KRW 50,000

Evaluation from the National Tax Service (NTS)



Consumer-facing operations such as retailing, food, and lodging reported more income, thereby contributing to tax revenue increase and enhanced transparency.

Sources: KIPF report, "Ten years - promotion policy of credit card use" (Dec 12, 2012, Korea Institute of Public Finance); Annual Report 2013, National Tax Service of Korea

Uruguay: Uruguay recently rolled out a comprehensive set of policies to promote financial inclusion. Toward this end, the government introduced policy changes and tax incentives to improve access, coverage, and depth of financial services among households, including the “Access of the Population to Financial Services and Promotion of Electronic Payment Means Act” No. 19,210 (known as the Financial Inclusion Act), which passed in April 2014 and came into force in August 2014. Among other objectives, the act aimed to transform and modernize the payment system. To achieve these goals, the government employed a battery of measures, most notably:

1. Creation and regulation of electronic money instruments
2. Mandatory use of bank accounts or electronic money instruments for payment of payroll, benefits, and retirement plans and pensions
3. Limits on the use of cash in certain transactions
4. Implementation of a set of tax incentives aimed at promoting the use of electronic payments, including a tax credit equivalent to the cost of the rental of the POS terminal for small merchants with annual sales under USD 462,000, and a differentiated VAT rebate for purchases made with payment cards⁶⁶.

A reduction of the VAT on purchases using cards and electronic payment means was the first of the Act's provisions to go into effect and were aimed at promoting the use of electronic payments, modernising the payment system, and favouring economic formalisation. By 2017, it is estimated that the collection of incremental VAT from card sales following the Act's enactment will exceed USD 300 million a year, while the tax revenue sacrifice for VAT reduction will be USD 58 million.

Impact: Within a year of implementation of the law, Uruguay has benefitted from the following:

- *High growth in debit transactions:* In the second half of 2014, POS transactions conducted using debit cards rose to nearly 10 million, more than triple the number for the same period the year before. As a result, the share of debit cards in total purchases using cards increased by more than 10 percentage points in the second half of 2014 compared with the same period the year before, rising from 7.2 percent to 18.8 percent in terms of payment volume and from 7.1 percent to 17.1 percent in number of transactions. The rise in POS transactions using debit cards was due to an increased number of cards in use as well as an increase in intensity of use.
- *Increased use of cards for consumer spending:* Consumer spending using cards rose from 12.3 percent in the second half of 2013 to 13.4 percent in the comparable period in 2014

⁶⁶ From a study commissioned by Visa and conducted by CPA Ferrere, a Uruguay consulting firm, in the first half of 2015. The study is based on public information from the central bank and information released by the local authorities and Visa's local acquirer. The study also includes data from surveys of consumers and merchants in Uruguay.

India could introduce tax benefits for small and medium enterprises and consumers

Our analysis suggests that if India invested a total of INR 58,000 crores (USD 8.6 billion) over the next five years through tax rebates, it could not only expedite the pace of payment digitisation but also save about INR 70,000 crores (USD 10.4 billion) in that period through a reduction in the cost of cash (Exhibit 32). With this infrastructure in place, and accounting for infrastructure replacement, operations and maintenance costs, we estimate India has the potential to save a total of INR 4 lakh crores (USD 59.4 billion) over the next five years, taking its total savings from digital payments to INR 4.7 lakh crores (about USD 70 billion) over ten years (Exhibit 33). India could explore introduction of the following tax benefits for SMEs and consumers:

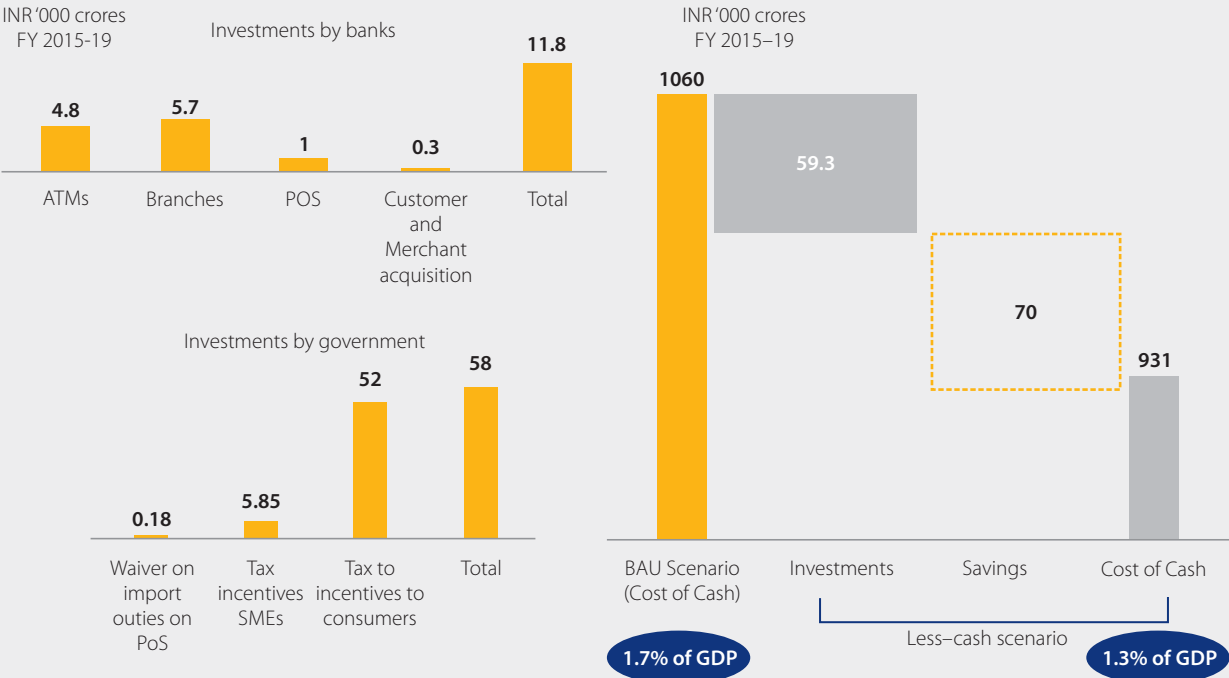
- 1 *Small and medium enterprises:* To incentivise all SMEs (existing registered SMEs and existing unregistered SMEs that are likely to register with concerned authorities and become part of the organised market) to accept electronic payments, reduce income tax liabilities, levy 12.5 percent tax on 50 percent of the revenue of SMEs as income-tax benefits.
- 2 *Consumers:* To encourage consumers to transact digitally, grant income tax benefits. Enact an income tax break of 5 percent on 20 percent of the total electronic spending done by individuals. If this tax break is applied to all income tax assesseees – estimated to be 4.86 crores for 2014-15 – it would mean a cap of about INR 2,000 (USD 29.70) per income tax assessee per year over five years. Given that a majority of the income tax assesseees fall within the 0 percent to 10 percent income tax bracket, introducing this cap would help to change the behavior of many consumers.
- 3 Another way to disburse incentives could be to offset them by providing rebates on payments made through the Bharat Bill Payment System. In this approach, the Government of India could compensate the revenue shortfall to entities receiving payments through this platform.

Further, the introduction of administrative sanctions similar to South Korea would encourage use and acceptance of digital payments. In addition, introduction of caps on cash transactions, recommended by the Special Investigation Team (SIT) that was appointed by the Indian Supreme Court, would be helpful. The SIT has suggested capping cash transactions at INR 3 lakhs (USD 4,450) and restricting holding of cash by individuals and industry to INR 15 lakhs (USD 22,288) in its report on reducing the flow of black money⁶⁷.

The Government of India could also benefit by mandating that all enterprises, including micro, small, and medium firms, pay salaries electronically to all employees (including contract labour), as Uruguay has done. Even households could be encouraged to do the same. Adopting this measure would significantly reduce the flow of cash in the economy. The 2016 USAID “Beyond Cash” initiative found that about 80 percent of the 2,500 consumers surveyed do not earn digitally, and only 20 percent save money in a bank account. This poses a significant barrier to transacting digitally. In addition, the survey showed that those earning and saving digitally have 2.5 times higher propensity to spend digitally.

⁶⁷ Ban on cash transactions above INR 3 lakh: SIT on black money: Economic Times, 14 July, 2016

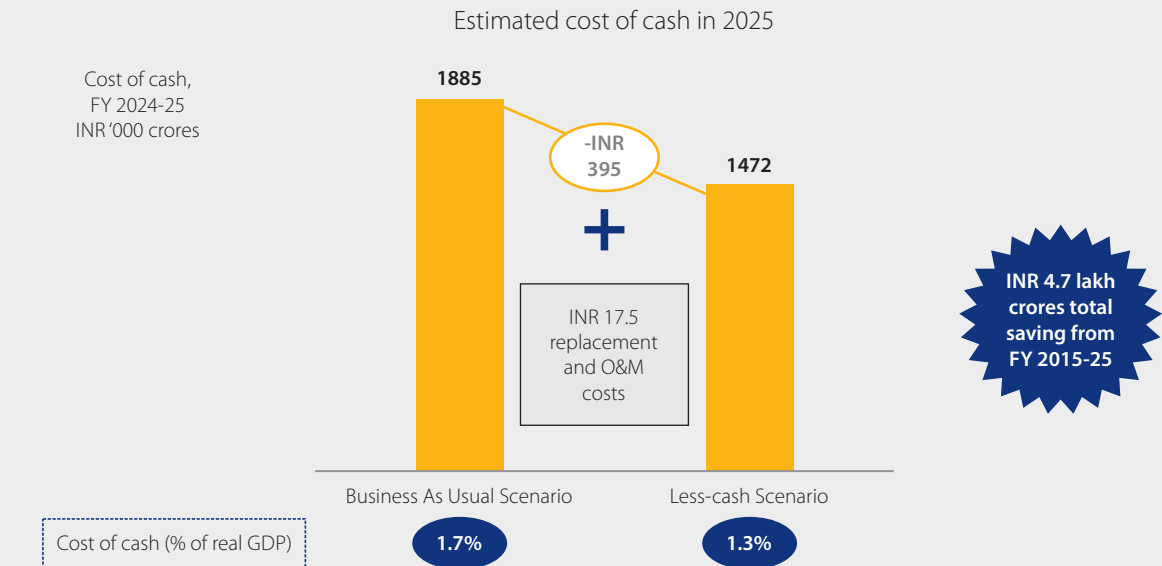
Exhibit 32: To reduce the cost of cash from 1.7% to 1.3% of GDP, banks and the government need to invest about INR 60,000 crores and undertake a few initiatives



¹ Investments exclude the branch and ATM costs incurred by banks as they are accounted for in the cost of cash calculation for banks

Sources: Internal analysis; MSME Annual Report, 2015; RBI Bankwise ATM/POS/Card Statistics, December 2015; Report by Samil PwC and KAIST Graduate School of Management, 2006

Exhibit 33: To reduce the cost of cash from 1.7% to 1.3% of GDP, banks and the government need to invest about INR 60,000 crores and undertake a few initiatives



Sources: Internal analysis; Ministry of Statistics and Programme Implementation, Government of India

C) Encourage the development of payment aggregators

According to the RBI's concept note on acceptance infrastructure dated March 2016, the top five acquirers account for nearly 81 percent of the POS infrastructure; the top 10 acquirers' share of POS is above 90 percent. One way to increase the number of acquirers would be to allow large non-banks to enter the business, as is the case in the United States. Developing specific criteria to allow large global players to participate independently in the acquiring business would increase competition and bring best practices to the market.

D) Track the payment history of consumers

Institutions like Equifax and Credit Information Bureau Ltd. today provide details on credit history of consumers and businesses but India lacks data on their digital payment history. Capturing and tracking this data would provide a comprehensive view of the payment patterns of consumers and businesses. This, in turn, would provide banks and payment service providers with insights that can be used to tailor products and expand their acceptance footprint.

2 Energise Innovation

The payments industry is evolving rapidly in India and around the world. As a result, the way people pay and get paid will change greatly in the next few years. Taking advantage of advances of these kinds would help India meet its objectives of promoting financial inclusion; reducing tax avoidance; improving transparency and access to the financial system; lowering the cost of capital through the establishment of a transaction history; and reducing the cost of cash in the economy. The government has made significant strides in this direction with the launch of the direct benefits transfer programme facilitated through its flagship Prime Minister Jan-Dhan Yojana, and which has led to about INR 36,500 crores (USD 5.42 billion) in savings. In addition, it has considerable headroom to do more with programmes like Digital India and Make in India.

The RBI is also doing its part. Embracing innovations like near field communication technology, encouraging banks to adopt mobile-based payment solutions, and introducing platforms like the Bharat Bill Payment Systems and the National Payments Corporation of India's Unified Payments Interface, are some of its marquee efforts to bolster the payments industry. In this section, we discuss some of the innovative approaches that governments elsewhere have pursued (Exhibit 34).

A) Embrace new approaches for government payments

Over the years, the United Kingdom has been a leader in adopting innovative payment approaches. Other countries have also taken steps to transition to a less-cash society. Below, we discuss two of the United Kingdom's highest-impact initiatives, the Government Procurement Card and London's open loop payment systems. We also summarise efforts undertaken by other governments.

Adopt open loop payment systems: Transport for London Example

Transport for London (TfL) is the statutory body responsible for carrying out the city's transport strategy. In 2007, TfL started work on the design of an open loop payment system known as Future Ticketing. TfL upgraded more than 20,000 readers and validators in buses, tubes, and train stations to support legacy Oyster cards, ITSO cards, and open loop contactless payment cards (CPCs). It designed and introduced a back-office system to maintain an account for every CPC in the system; the card acts as a token that links all usage to the account.

Customers with a bank-issued contactless card are able to use it to board a bus or pass through a gate at the tube station. A reader validates the card and records journeys, but fare calculations for CPCs take place in the back-office system, and customers see a single transaction on their statement at the end of a day's travel. As with Oyster, the fare is capped at the price of a daily Travelcard; the total fare for each week (Monday to Sunday) is capped at the cost of a weekly pass. Adjustments (for example, from service disruption or incomplete journeys) are normally handled within the fare calculation, so refunds, which are also dealt with by the back office system, can be minimised.

TfL removed the option to pay cash for bus fares in July 2014; after that, passengers had to use an Oyster card or a bank-issued contactless card. By mid-July 2015, more than 130 million journeys had been made using bank-issued contactless cards. On a typical day, 15,000 to 25,000 new cards are used, with the peak occurring on Saturdays and during holiday periods, suggesting that visitors as well as Londoners are making use of the feature. Cards issued by banks in more than 60 countries have been used.

Existing mobile (near field communication technology) payment apps, including Apple Pay, work in the system; other devices accepted include key fobs, wristbands, payment stickers, and payment tags such as Barclaycard bPay, EE Cash on Tap, and Vodafone Smart Pass.

Given the success of open loop payment systems for transit, many public transport agencies and operators in the Asia-Pacific region, including the Land Transport Authority of Singapore, the states of New South Wales and Queensland (Australia), and the city of Jakarta (Indonesia) are considering the adoption of such systems, as are many cities in Europe and North America.

1) The Government of India should adopt an open loop payment system for mass transit payments

India could leapfrog the development of transit payment systems, unlike other countries that are now spending freely to migrate to open loop, interoperable systems. The Reserve Bank of India's Payment Vision 2018 also emphasises the need for interoperable payment mechanisms for mass transit systems built on open standards, preferably using open system payment instruments. Free and fair competition that allows bank-issued contactless chip cards from all networks to participate in transit payments would help ensure consumers are the main beneficiaries of the changes taking place in digital payments. It would provide them with competitive service offerings and a convenient, seamless experience. With 15 metros under construction, and many others announced, India would significantly benefit from adopting open loop payment systems for mass transit and, at the same time, would further its vision of a common card. Benefits of this approach would be:

1 *Ease of execution:* Deploying a truly open loop interoperable solution will enable the Government of India to

- *Use the existing cardholder base and contactless infrastructure:* Employing contactless cards at transit gates would allow continued use of existing payment infrastructure, as transactions would be settled by the respective networks through which they are routed. For example, more than 100,000 terminals supporting contactless cards have been deployed as of May 2016, and according to industry estimates, about 10,000 such terminals are being added by Indian merchants each month.
- *Technological ease:* Deploying such a solution does not require adding an application to the bank-issued card chip to speak with the payment terminals at the gates.

- *Smoothen the adoption of newer technologies:* Contactless EMV⁶⁸ is compatible with many upcoming near field communication solutions like Apple Pay and Samsung Pay, so an investment made in this area will be valuable for years to come.
- 2 *Cost savings:* Adopting an open loop globally interoperable solution would result in significant cost savings for issuing banks, and ensure that existing cardholders could benefit by using bank-issued, contactless chip cards. In the absence of such a system, banks incur higher costs to either re-card their existing cardholder base or to issue an additional card with the relevant technical specifications supporting the transit payment application. Since India is building brand-new mass transit systems, deploying EMV contactless Automated Fare Calculator-enabled gates would allow the country's transit payment systems to leapfrog existing approaches. It would also result in significant savings by avoiding re-carding or additional card issuance costs.
 3. *Secure and easy use for customers:* Working with the "Pay As You Go" concept, this solution would allow bank-issued contactless cardholders from India or anywhere in the world to easily use the country's mass transit systems without acquiring new cards or waiting in long queues to buy tickets. Our experience shows that such solutions enable faster movement through gates, lower fraud and free-riding, lower cost of ticket sales, and improved customer experience at stations.
 4. *Benefits to public transport operators:* Adopting bank-issued contactless chip cards would provide several benefits to transit operators, including:
 - Reducing the cost of ticket issuance, particularly for casual riders.
 - Offering the ability to store fare tables centrally, making it easier to change or update fares.
 - Avoiding locking in suppliers – open standards would allow equipment to be purchased from any mix of suppliers.
 - Enabling a focus on value-added client services rather than simply on ticket issuance.

Introduction of government procurement and disbursement cards

Introduction of cards, especially for government payments, can be a big step toward payment digitisation. In 1997, the UK government rolled out its Government Procurement Card. The technology allowed government staff to purchase supplies, equipment, professional services, and materials with either a charge card or a virtual account. This initiative involved more than 2,000 public sector organisations that were doing transactions worth more than EUR 7 billion. Among the results of the programme were:

- Savings of about EUR 1 billion.
- Environmental impact that included saving 66 million sheets of A4 paper, the equivalent of 254 tonnes of CO₂.
- Reduction of the administrative burden of approvals, issuing purchase orders, and preparing invoices, plus simplification of tracking and monitoring of purchases.

In addition to the United Kingdom, several government agencies around the world with which we have worked have benefitted from adopting digital payments, as outlined in Table 1 below.

⁶⁸Europay, MasterCard, Visa

Table 2: Government adoption of Digital Payments

Country	Key initiatives undertaken	Impact
United States	Launched a government disbursement card in 2006 to pay unemployment insurance benefits	Saved more than USD 32 million
United Arab Emirates	Introduced a prepaid card that can be used to expedite online payments for various government services, including Emirate ID cards, visa renewals, court cases, and utility bills as well as e-commerce	Showcases the positive impact public-private partnerships can have on economic development
United States, Chicago	Chicago Public Schools employs about 54,000 people and wanted to reduce payroll costs. ADP TotalPay card programme provides employees and student workers with a safe and convenient payroll solution at a lower cost to the district	Nearly 100 percent of the district's payroll is distributed electronically, allowing officials to focus more on educational issues
United States, Nebraska	Issues the Reliacard to disburse child support benefits; 97 percent of disbursement is done through this channel	Cost of paper, printing and postage has been reduced by 93 percent
Dominican Republic	Launched the Solidaridad prepaid card to disburse nine subsidies in support of low-income university students and citizens who need help paying for fuel, gas, and electricity	Government can now track and control benefits distribution and ensure it helps those who need it most while reducing subsidy distribution costs
Western Australia	Introduced a purchasing card and central travel account (virtual card) across 138 public authorities for low value – high volume purchases (under AD 5,000)	Boosted annual transactions savings by more than AD 368,000 and gained estimated efficiency savings in excess of AD 9.6 million
New Zealand	Introduced a purchasing card to improve resource utilisation, reporting, and efficiency	Reduced manual input of supplier invoices by 65,000 a year and the number of one-off suppliers and expense claims by 50 percent
Peru	Launched the BanMat Electron prepaid card programme for home construction loans for low-income households. Card programme delivered loans ranging from USD 600 to USD 14,000. Eighty percent of the loan amount could be used to purchase construction materials from 1,300 pre-approved suppliers, and up to 30 percent could be used as cash advances for labour	More than USD 40 million has been disbursed; the card was an integral tool in helping the population affected by the earthquake in the Pisco region

2) Promoting commercial cards and expediting digitisation of person-to-government payments could yield significant benefits for India

Drawing from these global experiences, various Indian government-owned entities could move towards adopting such procurement cards. While the government has made a start with its JAM⁶⁹ initiative, it has only scratched the surface. India could benefit significantly if various central government-owned entities used digital payments as well as the 70 or so departments that fall under more than 50 ministries. Encouraging citizens to make various government payments through digital instruments like cards, mobile based solutions could accelerate the transition to a less-cash society.

B) Actively encourage adoption of new form factors, products and technologies, and platforms

Innovations in technology, form factors, regulations, and platforms are disrupting the payments industry in India. These innovations will determine changes in where and how to pay. In addition, they will be essential to helping India overcome the challenges associated with financial inclusion – last-mile connectivity, infrastructure issues, and the high cost of doing business in remote areas. In this section, we discuss innovations that could alter the payments landscape over the next five to seven years.

1) Form factors

The introduction of mobile money and digital wallets has democratised payment, as the flow of transactions across various form factors become seamless. Today, there are more than 200 million prepaid payment instruments in India. Mobile payments have grown from USD 88 million in 2011 to USD 1.15 billion in 2016, a compound annual growth rate of 68 percent⁷⁰. About 15 percent of internet users in India use m-wallets to make purchases⁷¹. Further, as the use of mobile POS devices accelerates and customers and merchants become more open to e-receipts, acceptance costs are likely to decline. Mobile POS devices cost roughly 25 percent of the price of conventional devices and are less expensive to operate. This evolution in form factor could dictate the future of India's mobile payments story. Typically, smaller merchants have a higher merchant discount rate, even though interchange is the same, because of perceived risk and higher servicing costs. Acquiring fees begin to drop once merchants achieve a certain payment volume. However, mobile payment solutions remove much of the acquirer sign-up and servicing costs, thereby making electronic payments more attractive to smaller merchants.

Next, mobile or digital solutions that facilitate person-to-person or person-to-merchant payments will change the payments landscape in India. These approaches will enable the routing of transactions through payment networks using mobile phones. For example, merchants could replace the physical POS terminal with a pre- or auto-generated QR code for mobile payment acceptance. This eliminates the need for electricity, a constraint in remote areas. Further, such mobile-based solutions simplify acquisition and reduce the cost of providing service to the merchant through physical visits and the need for printing receipts by offering instant notification by phone.

⁶⁹ Refers to Prime Minister Jan Dhan Yojana, Aadhaar, and mobile connectivity

⁷⁰ The Economic Times Wealth, April 18-24, 2016

⁷¹ *Ibid*

2) Products and technologies

Estimates suggest the e-commerce market could grow about 40 percent annually for the next five years⁷². Products and technologies that help reduce friction and improve customer experience in online commerce while maintaining the highest standards of safety and security will spur further growth of this channel. Penetration of NFC technology, allowing contactless communication and maintaining interoperability between different wireless communication methods like Bluetooth and FeliCa (commonly used in Japan) will change the way Indian consumers pay. For instance, more than 100 million people around the world are expected to use an NFC handset to make a purchase this year, while the value of transactions conducted through an NFC device is expected to grow from USD 30 billion in 2016 to USD 240 billion in 2021⁷³. We anticipate that the popularity of NFC devices will increase as competition between the mobile-wallet products of device vendors, payment card issuers, and mobile operators intensifies and contactless payment infrastructure matures across most regions. Banks in India are issuing contactless chip cards and, with the advent of Apple Pay, Samsung Pay and other such payment instruments, traditional methods will become less and less popular. The RBI has indicated its preference for NFC devices by relaxing the mandatory two-factor authentication for transactions up to INR 2,000 (USD 29.70) using contactless cards across all merchant categories⁷⁴.

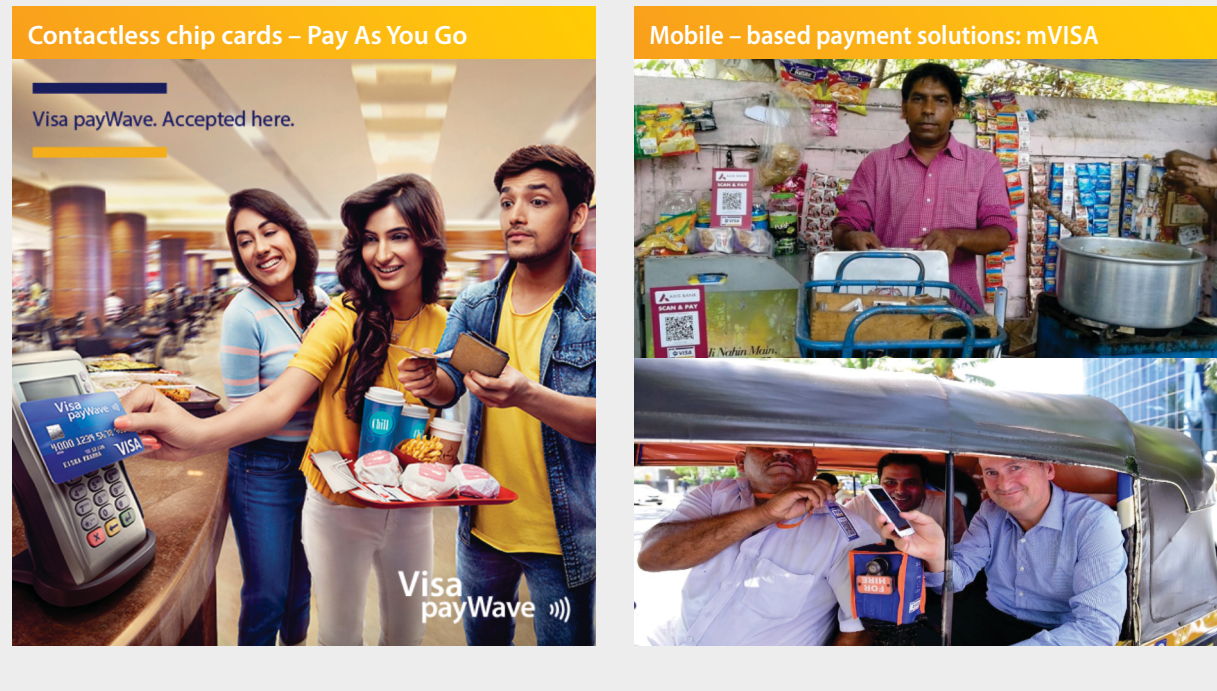
Exhibit 34: Efforts to energise innovation and bolster financial participation would be beneficial

Energise Innovation	Bolster Financial Participation
<div>Embrace new approaches for government payment</div> <ul style="list-style-type: none">• Adopt open loop systems for mass transit with each payment network able to do settlement directly• Introduce government procurement and disbursement cards <div>Actively encourage adoption of new form factors, products and technologies, and platforms</div> <ul style="list-style-type: none">• Diffusion of near field communication technology• Mobile-based, person-to-person and person-to-merchant payment• Aggregated platforms, e.g. BBPS, PayGov	<div>Focus on five areas to promote financial participation:</div> <ul style="list-style-type: none">• Introduce certification standards and craft innovative business models for business correspondents• Help promote financial participation at the last mile, working with existing microfinance institutions• Craft modules and programs to inculcate financial literacy programs at school level and higher education• Design specific programs to meet the needs of underserved segments e.g. farmers, women• Facilitate inter-ministerial collaboration and engagement with the states

Sources: Internal analysis; expert Interviews; Microfinance Unit for the Community Learning Centre (CLC) "Harmoni," UNESCO Country Profile: Indonesia; Report of the GIRO Advisory Group, 2014, RBI; Office Memorandum, Department of Economic Affairs, Ministry of Finance, February 2016; Visa Government Solutions, 2011

⁷² Morgan Stanley: The Next India: Internet opening up new opportunities, 2015
⁷³ Strategy Analytics forecasts accessed on 22 April 2016 at <http://www.nfcworld.com/2016/03/10/343180/more-than-100m-people-will-make-an-nfc-mobile-payment-in-2016/>
⁷⁴ The RBI circular dated May 14, 2015: Card Payments – Relaxation in requirement of Additional Factor of Authentication for small value card present transactions

Exhibit 35: New form factors and technologies will change the way we get paid and pay



3) Aggregated platforms

Important innovations are also happening in the platforms that will facilitate electronic transactions. The recently launched Unified Payments Interface (UPI) aims to provide a secure, efficient, and inclusive payment system that will permit users to make instant payments via mobile, web, and other applications. The UPI would allow users to make payments by providing virtual addresses without the need for furnishing bank account details or multiple credentials such as customer IDs and passwords, thereby making the process more convenient for customers.

The Bharat Bill Payment System (BBPS) has been designed to facilitate and aggregate payments for utility services such as electricity, water, gas, and telephone. A report from the GIRO committee estimates that the billing market in the top 20 cities in India is INR 6.2 trillion (USD 92.1 billion), with more than 30.8 billion bills generated annually⁷⁵. According to NPCI, customers pay 90 percent of their bills in cash and by check and about 70 percent in cash at company locations. BBPS is an interoperable system that can serve customers online as well as through a network of agents. The BBPS will allow operating units to develop their network of agents to facilitate and aggregate various bill payments to introduce efficiencies through economies of scale. A set of payment options including part payment, excess payment, minimum payment, and penalty payment will be available. This system will also provide instant confirmation of payments and a dispute resolution and grievance-mitigating mechanism.

PayGov: PayGov is a unified common platform that consolidates payments at the central, national, state, and local government levels to further card and digital payments. The Department of Electronics and Information Technology (DeitY) envisaged a common e-payments infrastructure that will offer an end-to-end transaction experience. DeitY, along with NSDL Database Management Ltd., created a common infrastructure that government entities can use to offer services such as internet banking, or the ability to use credit and debit cards to make government payments. The portal has already facilitated

⁷⁵ Committee to study the feasibility of implementation of GIRO-based payment system in India

INR 20.5 billion (USD 0.3 billion) in value from 55 departments and agencies. Eight additional departments and agencies have completed integration and 28 more are in the process of integrating with the common platform. The United States has a similar platform — also named PayGov — that offers a secure electronic payment system for federal agencies. The US counterpart processes a wide array of transactions, such as loan payments, medical expenses, fines and penalties, national park service fees, and donations.

Multi-stakeholder collaboration in fintech

The fintech sector globally and in India is playing an important role in disrupting the conventional payments landscape. Collaboration between various stakeholders – academia, traditional financial service providers, and technology firms – to co-invest and co-create has the potential to dismantle barriers to digital payments at an accelerated pace. With Start-Up India, this model has begun to resonate in India. Globally, some leading financial institutions like the Development Bank of Singapore and Barclays have established different approaches to either collaborate with academia or establish incubation centres to foster co-creation.

3 Bolster Financial Participation

The 2016 “Beyond Cash” study published by USAID, which included a survey of 2,500 Indian consumers and merchants, cites four main reasons for the slow growth of card acceptance.

- *Merchant awareness and interest is low:* 60 percent of the merchants sampled were unaware that they could accept debit cards for receiving payments. Of those who were aware, only 40 percent were interested in accepting cards in the future. The need to make cash payments to suppliers is the leading reason for lack of merchant interest.
- *Merchant readiness and willingness:* Merchants don’t fully understand and appreciate the benefits of the efficiencies and security of electronic payments relative to cash payments.
- *Consumer demand is low:* Building stronger cardholder and merchant awareness of the benefits of accepting electronic and card payments is a critical success factor.
- *Security concerns:* Merchants and cardholders fear the security risks of paying electronically.

These findings point to the need to bolster financial literacy. To that end, we propose interventions below that could gradually improve financial literacy in India, and outline the institutional architecture to do so. We also share examples of successful models for encouraging financial literacy, including those adopted by microfinance institutions.

Focus on five areas to advance financial participation: Some self-help groups, microfinance institutions, and NGOs are working with women and the poor on financial literacy through extensions of their daily activities. A “Seven State Financial Literacy Assessment Study” by the United Nations Development Programme⁷⁶ compares the efforts of formal channels like RBI and NABARD to those informal channels. The study showed that the scale of informal channels has been much bigger – 48 participating organisations compared with only eight formal institutions. Even though the content covered by formal channels was wider and the programmes longer, the practical exposure to financial transactions made the knowledge retention and awareness of participants of informal channels equal or even better than those participating in formal programmes.

⁷⁶ “Financial literacy as a tool for financial inclusion and client protection,” UNDP, 2012

Microfinance institutes and regulators shouldn't be the only parties responsible for improving financial literacy. Corporations also have much to gain in an economy where more people transact digitally; they could assist in this exercise as well. To facilitate private sector participation, the Ministry of Corporate Affairs could consider an explicit mention of financial participation expansion programmes as a key activity in Schedule VII of the Companies Act. This would encourage private sector involvement and funding; such efforts would benefit the economy at large, including the private sector. In addition, we outline five areas that India could focus on to advance its financial literacy and participation efforts.

A) Craft modules and programmes to build in financial literacy approaches at the school level and higher education

In the spirit of giving everyone the opportunity to access and use financial services, actively following a two-step approach could help align financial literacy programmes with the existing education system.

Financial literacy in school curriculum: The Ministry of Education in Brazil has a financial education programme reaching more than 5,000 public high schools⁷⁷. The content encompasses didactically innovative material designed to capture the interest of young people, including 72 case studies that teachers can incorporate into school subjects. The material is interactive and includes exercises that students complete with their parents' such as household budgeting.

In India, the Draft National Strategy for Financial Education envisages the inclusion of basic financial education in school curriculum up to the senior secondary level. Similarly, the Central Board of Secondary Education (CBSE) has launched a project for high school students involving opening accounts with nearby banks and day-to-day interactions to understand personal finance basics. The introduction of these programmes is a big leap in expanding financial services education. However, what is required is to treat this programme not just as an ad-hoc subject, but also to integrate it with the core curriculum of the board and to make it mandatory. Though CBSE's efforts are at the central level, a huge network of schools is under the purview of state boards, the International Baccalaureate, and the India Certificate of Secondary Education established by the Council for Indian School Certificate Examinations. Stakeholders could better publicise the CBSE efforts and craft a detailed rollout plan for other boards to consider. Other existing learning programmes sponsored by private entities, such as the Bombay Stock Exchange's financial literacy education tool-kit, could contribute to the broader efforts.

Financial literacy in higher education: Classifying financial literacy as a basic life skill and including it as a foundational course in central, state, and private universities will reap dividends for the country as a better-prepared generation of young people enter the work force. In the short term, we can work toward this goal by introducing a straightforward, yet mandatory, "Finance 101" course in all universities.

Dartmouth College in the United States has a series of 10 quantitative modules, each one consisting of an online slide presentation, spreadsheets and worksheets for students, associated case studies, and assessment tools⁷⁸. The University of South Africa has a course on personal finance management, a six month-long engagement covering topics like severance and retirement, financial risks, pension versus provident funds, investment alternatives, and income tax⁷⁹.

⁷⁷ "The Impact of High School Financial Education," World Bank, 2013

⁷⁸ Money Matters: The Financial Literacy Initiative at Dartmouth College, The Centre for Mathematics and Quantitative Education at Dartmouth

⁷⁹ University of South Africa

Another crucial segment to address are India's vocational training institutes. The government has already targeted this segment by introducing short-term courses on financial literacy through Industrial Training Institutes (ITIs). The ITIs can help private vocational training institutes by explaining the importance of integrating financial literacy programmes into their core courses.

B) Design specific programmes tailored to meet the needs of various types of underserved segments

Indian women's participation in the financial system is limited, as can be seen by their use of debit cards or the use of the internet to make payments (Exhibit 22). Programmes designed to teach farmers about the formal financial system and its benefits, including introducing them to products like crop insurance, could go a long way to reducing their dependence on village-level moneylenders. Indonesia's "Harmoni" project may offer a useful model for India's financial literacy efforts⁸⁰. The programme aims to help villagers build their financial literacy so that they can better manage their finances and enhance local business opportunities. The participants are farmers and palm sugar makers. They gather in groups of ten, and meet twice a week for about six months. The goal is mastering primary financial literacy and to understand better microfinance and develop skills to manage it. If the participants successfully complete the programme, they have the opportunity to borrow money from a local microfinance unit. One advantage of such an approach is that participants can avoid aggressive local moneylenders.

C) Facilitate inter-ministerial collaboration at the centre and engagement with states

Various agencies, including the Ministry of Agriculture and Farmers Welfare, Rural Development, Human Resource Development, and Urban Development, could use existing programmes and platforms to promote financial literacy and create awareness of the benefits of participating in the formal economy. The government could facilitate delivery of financial literacy programmes under schemes like the National Urban Livelihoods Mission and the National Rural Employment Guarantee Programme. Turning to platforms, the government could employ existing ones like mKisan and the Farmers Portal to offer online modules and financial literacy toolkits. For instance, the mKisan SMS Portal for farmers enables dissemination of information, services, and advisories to farmers. Interfaces like the Farmer's Portal distribute knowledge on crop management, agricultural risk management, and veterinary services. These public service platforms could serve as case studies for the design of financial literacy programmes. For instance, Common Services Centers (CSC) could host financial literacy courses at its 156,217 (as of January 2016) centers⁸¹. CSCs are multiple service, single-point entities present even in rural and remote locations. This makes them an ideal platform to spread financial literacy. Encouraging participants of existing government programmes like Mahatma Gandhi National Rural Employment Guaranty Act and National Skill Development Corporation to receive such training as a part of their work would ensure easy access to a wider population.

Finally, India must work on the existing regulatory environment for Digital India and expedite the implementation of the National Optic Fibre Network. Incentives for domestic companies to manufacture terminals are required to lower costs and increase competition and, in doing so, improve after-sales service and terminal functionality. The government has undertaken significant measures, but a lot more remains to be done.

⁸⁰ "Microfinance Unit for the Community Learning Centre (CLC)," UNESCO country profile Indonesia

⁸¹ www.csc.gov.in

D) Strengthen efforts to financial participation at the last mile, working in collaboration with existing microfinance institutions.

The government could collaborate with groups like the Microfinance Institutions Network to help scale up the financial literacy efforts of existing institutions. The partner organisations could support existing institutions by providing them with funds, talent, and other knowledge resources. Many microfinance institutions have been able to provide simultaneously products and financial literacy such as Janalakshmi Financial Services (JFS). JFS offers women and households small-batch loans that come with a form of insurance cover. For instance, a batch loan is provided to individuals in a group comprising a minimum of five and a maximum of 25 women, where each individual guarantees loan repayment for the others. This structure has five loan cycles. After completion of each cycle, a customer can borrow the same amount or move on to a larger loan amount. The loan size for each cycle ranges from 15,000 to 50,000 rupees, with an annual interest rate of nearly 24 percent. Visa collaborated with JFS to build the payment capabilities for this group. Working with banks and payment networks, JFS issued general prepaid cards and used digital approaches to help achieve scale and offer brand differentiation. The prepaid card is integrated with mobile POS terminals. These cost much less compared with conventional POS terminals and have contributed significantly to increasing the number of acceptance points.

E) Introduce certification standards and craft innovative business models for business correspondents

In India, there are three major agent network models at work. First, banks can directly manage agent networks. Second, specialised network operators manage agent networks for banks. Third, banks collaborate with mobile operators to manage agent networks. As a result, the number of banking correspondents in India is high but their skill levels vary. For example, according to a study by the Helix Institute, in India, 59 percent of agents have received training compared with 68 percent in Bangladesh, 92 percent in Kenya, 79 percent in Tanzania, and 94 percent in Uganda⁸². The study further reveals that more than half the agents have been operating for less than two years, similar to comparable countries like Kenya. However, the growth in banking correspondence in India results from a government mandate rather than business potential. In turn, this raises questions about the viability and longevity of the current approach. Improving the quality of service and designing innovative business models to strengthen an agent's profitability is essential.

⁸² Agent Network Accelerator Survey: India Country Report, 2015; Helix Institute of Digital Finance

Education and specially designed financial products

From OECD research–

“The Uganda Finance Trust Ltd., a microfinance institution, has been providing specially designed savings products with minimal identification requirements and fees and financial education to young people since 2009 (Reinsch, 2012). It now has three projects, one targeted exclusively at girls aged 10-19, and two newer projects aimed at young teens (12-17) and older youth aged 18-24. Youth also have the opportunity to take a loan once they have participated in the education process and saved for a year. The financial education is provided alongside internship opportunities, health tips, and other non-financial guidance in partnership with youth organisations.” (Atkinson, Messy (2013)). As of 2012, the Youth Programmeme had 7,432 clients of which 60 percent were below 18 years of age. “The three products offer youth the opportunity to open a savings account, specifically designed for them, with a formal, regulated financial institution. As compared to savings products for adults, the youth products have more flexible documentation requirements, lower fees for opening accounts, lower minimum balance requirements, and no maintenance or withdrawal charges. All three youth financial products have an integrated non-financial component, which equips the youth with practical knowledge and skills related to financial literacy and other disciplines that influence saving and spending behaviour and promote a smooth transition into adulthood. These non-financial services are accessed by youth in weekly or biweekly group meetings of one to two hours, depending on the availability of the youth. The training aims to increase the financial capability of the youth.” (United Nations Capital Development Fund)

Conclusion

In summary, India is at an inflection point in its payment digitisation journey. Innovations in form factors, technology, and measures like the Bharat Bill Payment System, Payments and Small Finance Banks are all building blocks of a less-cash society. Together, with a series of interventions by the Government of India, these building blocks could accelerate the pace and scale of digitisation.

However, additional government interventions will be necessary to increase the amount of personal consumption spent digitally from 5 percent to 36 percent; reduce the ratio of coins and notes in circulation to 10 percent from about 11 percent; and drop debit card usage at ATMs from 83 percent today to 76 percent (Exhibit 5) over the next five years. These include:

- Establishment of an acceptance development fund, with participation by all relevant stakeholders.
- Introduction of fiscal incentives for consumers capped at INR 2,000 per capita per year for five years as well as reducing 50 percent of the merchants' corporate tax liability on 50 percent of their revenues.
- Levying administration sanctions for non-acceptance of digital payments, and promoting caps for cash transactions.
- Reduction in taxes and duties for point-of-sale terminals, in addition to promoting domestic manufacturing.
- Adoption of open loop payment systems for mass transit that enable citizens to use bank-issued contactless chip cards to make transit payments, and allow individual payment networks to undertake settlement at the backend, as recommended in the Reserve Bank of India's Payment Vision 2018.
- Introduction of new regulations to mandate payment of all salaries electronically.
- Procurement by the Government of India's 70-plus departments to be done through a virtual account.
- Manifold efforts to bolster financial literacy and participation.

Achieving these outcomes would have far-reaching benefits, as India's cost of cash would drop from 1.7 percent of GDP to 1.3 percent of GDP during this time. This would result in savings of INR 70,000 crores (USD 10.4 billion) over the next five years and cumulative savings of INR 4.7 lakh crores (about USD 70 billion) over the next ten years. Needless to say, the time for further action is upon us.

We hope the findings in this report will help expand the consideration set of measures for the medium-term reforms under consideration by the committee constituted by the Department of Economic Affairs to review the framework related to digital payments.

Appendix 1:

Details of literature review on cost of cash research

Global-level studies: At a global scale, reduction of cash payments and moving toward electronic payments is expected to boost economic growth. Moody's Analytics analysed 56 countries that accounted for 93 percent of the world's GDP between 2008 and 2012 to study the benefit of moving away from cash payments and adopting electronic payments. The study showed that use of electronic payments added USD 983 billion to the GDP of various countries and raised consumption by an average of 0.7 percent across the 56 nations⁸³. A similar study conducted by Moody's Analytics for 70 countries between 2011 and 2015 estimated that that higher card usage contributed an additional USD 296 billion to consumption between 2011 and 2015, or a 0.1 percent cumulative increase in global GDP during the sample time period. That equals about a USD 74 billion contribution to GDP each year. Real consumption grew at an average of 2.3 percent in the same period, of which 0.01 percentage point is attributable to increased card penetration. This implies that card usage accounted for about 0.4 percent of growth in consumption, as well as an average increase of 2.6 million jobs over 2011-2015⁸⁴.

A MasterCard study in 2013⁸⁵ explored the evolution of consumer payment patterns in 33 countries from five regions, representing more than 85 percent of global GDP. The study considered both developed and developing countries and analysed their share of cash versus non-cash payments for consumers between 2006 and 2011, and readiness of these countries to move to electronic payments. The study concluded that the value of consumer payments was USD 63 trillion, of which only 34 percent was cash. In terms of volume, cash transactions accounted for 84 percent of the total USD 2.6 trillion transactions globally.

Country-region level studies: IBM studied the spending pattern of banks and retailers in Europe. It found that they spend about USD 72 billion annually to handle cash. The conclusions spurred the banks and retailers to look for ways to outsource cash handling. For example, the banks and retailers found that collaborating amongst themselves was difficult because of differing operational procedures and business models⁸⁶.

A study commissioned by the Bundesbank⁸⁷ estimated the cost of cash to the German economy at 2 to 3 percent of GDP. The study employed a largely demand-based approach that considered the internal and external costs of handling payments instruments by households, retailers, banks, other businesses, and central banks. Another study in Germany concluded that the economic cost of cash is more than EUR 8 billion a year⁸⁸. The study also found that the retail and banking sectors bear most of the cost of cash, and that banning or limiting cash could reduce the cost of the German shadow economy by up to EUR 35 billion a year.

A study by the Reserve Bank of Australia in 2007-2008⁸⁹ found that the annual costs incurred by financial institutions and merchants for cash payments made by individuals amounted to at least USD 8.5 billion, or about 0.8 percent of GDP.

⁸³ Zandi, M. (2013). The impact of electronic payments on economic growth. Moody's Analytics. West Chester: PA

⁸⁴ Zandi (2016), The impact of electronic payments on economic growth

⁸⁵ Hugh, T., Jain, A., & Angus, M. (2013). The global journey from cash to cashless. MasterCard

⁸⁶ IBM. (2007). Cashferium helps retails and banks cut costs by keeping cash flow local

⁸⁷ Kruger, M., & Seitz, F. (2014). Costs and benefits of cash and cashless payment instruments. Bundesbank

⁸⁸ Kleine, J., Krautbauer, M., & Weller, T. (2013). Cost of cash: Status quo and development prospects in Germany. Steinbeis Research Centre for Financial Services

⁸⁹ Schwartz, C., Fabo, J., Bailey, O., & Carter, L. (2014). Payment costs in Australia. Reserve Bank of Australia (RBA)

Theme-based studies: Studies have also tried to address complicated questions such as assessing the social cost of using cash. Social costs comprise all resource requirements arising in the payment chain, including the cost borne by all stakeholders in the payment chain, and, at the same time, excluding any fees that the stakeholders pay each other⁹⁰. In terms of social costs, cash has been found to be the most expensive instrument in Sweden⁹¹. The European Central Bank carried out a similar study across 13 EU countries and found that social costs of payments were almost 0.5 percent of GDP⁹². We could conclude that such costs are likely to be higher in countries like India, where cash is predominant.

To understand the costs involved for each party in a transaction, studies have also used a marginal cost approach⁹³. One study attempted to understand the cost to each party for a typical grocery store purchase using cash, cheque, debit card, or credit card. The study found the following:

- For merchants, credit cards are the most expensive form of payment and cash is the cheapest, given the size of the transaction.
- For consumers, cash and cheque were the most expensive and credit card the cheapest.
- For society, overall, debit card was the cheapest, followed by credit card, cash, and cheque. The rankings of the costs associated with payment instruments are sensitive to the overall size of transactions as well as the volume processed in a country⁹⁴.

Studies focused on India: In India, studies to calculate cost of cash have been revealing but are limited to certain types of payments. For instance, McKinsey found that India could save up to USD 22.4 billion annually by shifting to all electronic government payments⁹⁵. A study by the Fletcher School, Tufts University⁹⁶ showed that the RBI and commercial banks face USD 3.5 billion in currency-operations costs annually. The report also explored the cost of cash for consumers in Delhi and Hyderabad. It found that using cash costs Delhi residents USD 1.5 million a year; in Hyderabad, the comparable figure is USD 0.5 million.

Another study by the Institute of Business in the Global Context, the Fletcher School, Tufts University, found that card users in the most affluent part of India's megapolis use cash in 73 percent of expenditures compared with only 17 percent by card⁹⁷. The institute also studied the value chain of cash and currency operations in India (printing, disbursement, and withdrawal) using secondary data to conclude that the cost of printing amounted to INR 28.7 billion (USD 0.4 billion) in 2012–13 and has increased at a compound annual growth rate of 7 percent⁹⁸.

⁹⁰ Turján, A., Divéki, E., Keszy-Harmath, E., Kóczán, G., & Takács, K. (2011). Nothing is free: A survey of the social cost of the main payment instruments in Hungary. Magyar Nemzeti Bank

⁹¹ Bergman, M., Guibourg, G. & Björn, S. (2007). The costs of paying: Private and social costs of cash and card. Sveriges Riksbank

⁹² Schmiedel, H., Kostova, G., & Ruttenberg, W. (2012). The social and private costs of retail payment instruments: A European perspective. Occasional paper series 137. European Central Bank: Frankfurt am Main

⁹³ Garcia-Swartz, D.D., et al. (2006). The move toward a cashless society: A closer look at payment instrument economics. Review of Network Economics, 5(2), 175-198

⁹⁴ Humphrey, D., B. (2010). Retail payments: New contributions, empirical results, and unanswered questions. Journal of Banking & Finance, 34, 1727-1737

⁹⁵ McKinsey. (2010). Inclusive growth and financial security: The benefits of e-payments to Indian society. McKinsey: New York

⁹⁶ Chakravorti, B., Mazzotta, B., Bijapurkar, R., Shukla, R., Ramesha, K., Bapat, D., & Roy, D. (2013). The cost of cash in India. Institute of Business in the Global Context, Fletcher School, Tufts University.

⁹⁷ Bijapurkar, R., Shukla, R., & Bordoloi, M. (2014). Reasons and attitudes to using cash in India. IBGC Working Paper

⁹⁸ K. Ramesha, D. Bapat & D. Roy. (2014). Cash and currency operations in India. IBGC Working Paper

Gaps in methods and data used

Methods: The India-based studies by McKinsey and the Fletcher School estimate cost of cash from the perspective of the government, RBI, commercial banks, and consumers in only two cities in India. These stakeholders are important but they do not form the entire ecosystem. In some places, the methodologies for the computations are fragmented and do not yield a comprehensive, cumulative cost of cash estimate for India. Some global studies are comprehensive, but rely on large-scale primary surveys.

A study in the *Journal of Payments Strategy and Systems*⁹⁹ classifies costs associated with the use of paper-based payment instruments and cash into three groups – resource, transfer, and economic externality costs. Resource costs include time-based opportunity costs (the time it takes to get to an ATM to withdraw cash), time-based labour costs (end-of-day cash processing), and capital and technology-based costs (hardware costs for maintenance of cash registry). Transfer costs include fees paid for payment processes (transaction fees, surcharges, and outsourcing), while economic externalities include costs associated with use of cash in the underground economy, theft, and robberies.

At best, studies in India have tried to address time-based labour costs, capital and technology costs, and transfer costs for selective players, government, the RBI, and consumers in Delhi and Hyderabad.

Data: Given the paucity of published time series data on various stakeholders – households, banks, government, and businesses – we have used multiple data sources to conduct these analyses. We recognize such an approach has limitations because of inconsistencies that might emerge from the disparate and dated nature of the data. However, working within these constraints we have relied on inputs from experts, practitioners, and academics and deployed statistical techniques to overcome data-specific issues.

Our approach for this work

Comprehensive consideration of the important stakeholders in the payment landscape requires dividing them by the demand and supply sides. On the demand side, the players are the government, individuals, and businesses. The supply side comprises commercial banks, central bank, and the intermediaries (cash logistic companies). A systematic estimation of the cost of various payment media also involves determining the payer and payee in each transaction, both within and between the demand side and supply side stakeholders. However, given the practical constraints regarding data availability, the following approaches appear favourable for a comprehensive estimation of cost of cash.

Methods:

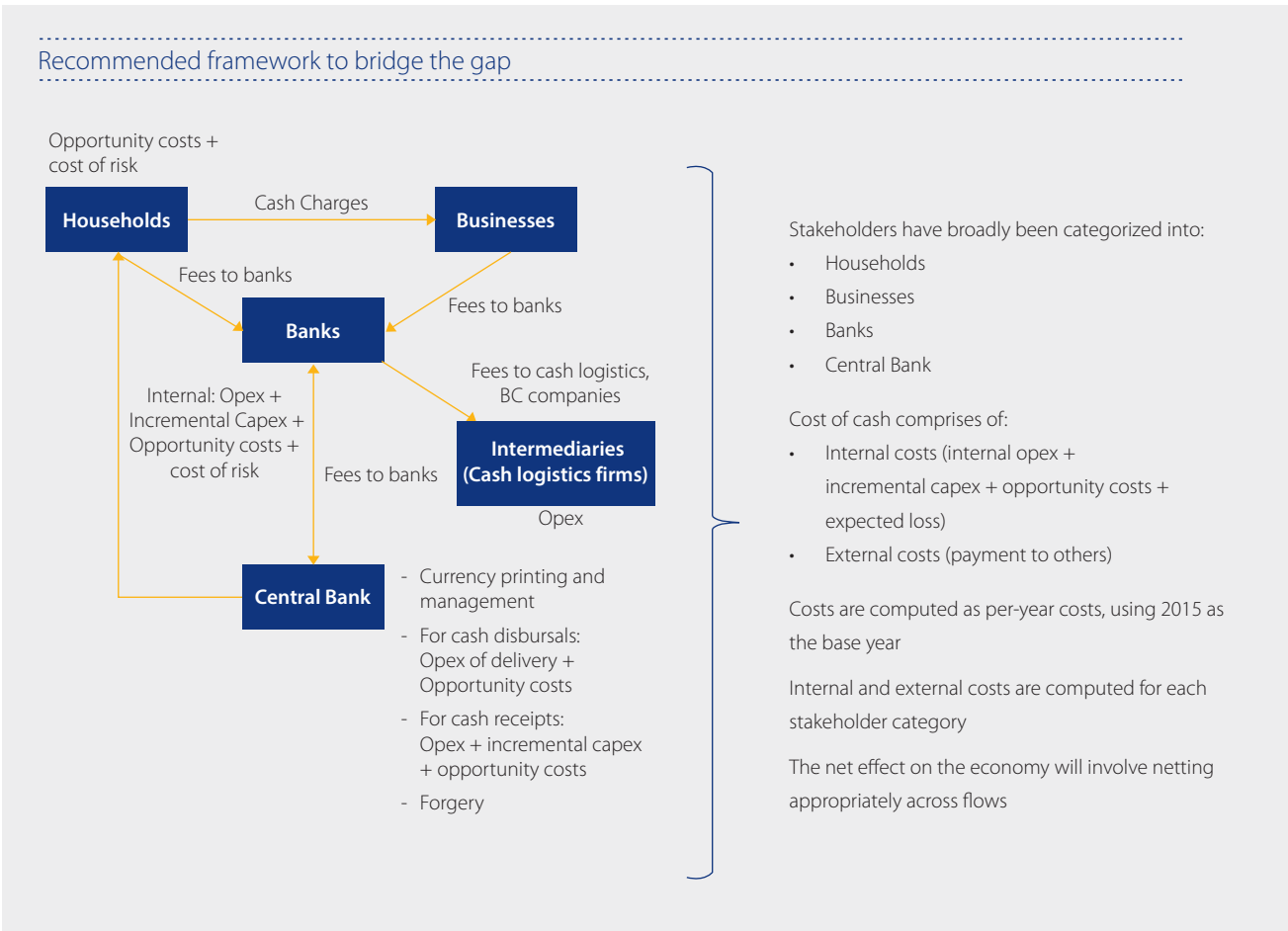
- Adopting and modifying the approach used by the European Central Bank, Bundesbank, and Sveriges Riksbank to compute the cost of cash.
- Focusing especially on the Bundesbank since it is the closest in scope. The study by the Bundesbank examines the cost of cash from the perspective of households and businesses that use a variety of payment instruments and does not rely on the use of primary surveys. The study seeks to examine the economic importance of payment transactions and to contribute to factual debate to determine the framework conditions to ensure smooth settlements of payments.
- Absence of robust data on business-to-business and government-to-business transactions pushed us to focus on costs from a household's transaction perspective.

⁹⁹ Banka, H. (March 2015). Moving towards electronic payments in India. *Journal of Payments Strategy and Systems*, 9(2)

Data approaches:

- Using estimates and analytical models to stitch together different sources of data.
- Attempting to derive a comprehensive picture of consumer income, expenditure, savings, assets, and flows from existing data.
- Cross-referencing, benchmarking, and ensuring internal consistency of data.
- Omitting business-to-business cash usage considerations.
- Using industry sources to cross-verify the integrity of data.

We developed a framework that takes account of the interaction between the demand-side and supply-side payment actors, drawing from the Bundesbank framework.



Appendix 2:

Methodology employed to compute cost of cash for all stakeholders

Cost of cash to consumers

We conducted the segmentation of households using data from the Census 2011 and World Bank’s FINDEX. Costs were calculated by segment and sub-segment. The unbanked do not use the formal financial system and therefore bear no opportunity costs of accessing ATMs and branches. Commercial banking channels are the only formal networks considered, so the study omits non-bank networks like the post office or cooperatives.

Cost of cash to consumers =
Foregone interest earnings on cash holdings +
Cost of risk of cash holdings +
Opportunity cost of time spent visiting and transacting at ATMs and branches +
Fees paid to banks at ATMs and branches

Where:

Foregone interest earnings on cash holdings =
(cash holding per month + cash expenditure per month/2)*4%

Cost of risk of cash holdings =
(cash holding per month + cash expenditure per month/2)* probability of theft that varies on the nature of the HH and its location.

Using private final consumption expenditure data from the Ministry of States and Programme Implementation, and urban and rural expenditure benchmarks from the National Sample Survey Organisation, we derived annual expenditure of different households. Based on proprietary data from the Indian Consumer Economy 2013-14 survey conducted by People’s Research on the Indian Consumer Economy 360, we added the different savings rates for banked and unbanked and urban and rural households to calculate their income profiles. Household cash expenditure is assumed to be 90 percent for urban and about 85 percent for rural households, respectively. The average monthly cash holding is calculated as the average of cash holdings at the start and end of the month, multiplied by the savings account interest rate of 4 percent, standardised to a month. The cost of risk assumes that the entire cash holding per household is lost upon incidence of theft, or inadvertent loss and is estimated based on industry feedback.

Opportunity cost of time spent visiting and transacting at ATMs (branches) =
[(Transit time + queue time + time per transaction) * Hourly household wage earnings]/60

The opportunity cost borne by households is the time spent per household per year accessing and using ATMs and branches multiplied by hourly earnings, which is annual income divided by the number of hours in a year. Fees are paid by households at urban ATMs at a rate of INR 18 (USD 0.27) for every transaction above five transactions. Additionally, at branches a transaction fee of INR 5 (USD 0.07) per deposit or per withdrawal is assumed.

Cost of cash to businesses

We assume that private final consumption expenditure (hereinafter referred to interchangeably as PFCE or retail spending) by households is equal to the earnings of retail businesses in India. Five business segments were considered: large enterprises, registered micro enterprises, registered small enterprises, unregistered micro enterprises, and unregistered small enterprises.

First, an estimate of the size of the organised segment (for example, large retail enterprises with sizeable storefronts) is made. Using data from Boston Consulting Group, McKinsey, and IBEF¹⁰⁰, we estimated that large enterprises account for 18 percent of retail spending. Using publicly available data such as annual reports and investor presentations, we assembled data points such as daily turnover, per-transaction size, percentage of cash transactions, number of stores, and number of employees for large enterprises across retail sectors like groceries, food and beverage, and hospitality. For each such sample enterprise, per-day transactions and cash transactions per store were estimated. The cost of accepting, storing, managing, and clearing cash for each sample enterprise across its entire network was estimated and the figure represented as a percentage of its cash revenue. This percentage was calculated across the sample and averaged to arrive at a cost of cash for large enterprises, expressed as a percentage of revenue, which was then applied to the estimated size of the organised sector to arrive at the total cost of cash for large enterprises. The precise costs considered and the numeric formulation are presented below:

$$\begin{aligned} \text{Cost of cash to an individual enterprise (\%)} = & \\ & [\text{Opportunity cost of employee time spent accepting cash transaction} + \\ & \text{Opportunity cost of employee time spent clearing and managing cash} + \\ & \text{Fixed costs of cash infrastructure} + \text{Fees paid to banks for cash management} + \\ & \text{working capital loss on delayed cash deposits} + \text{Cost of risk of cash holdings}] / [\text{Revenue of enterprise}] \end{aligned}$$

A similar approach was followed for small and micro enterprises, both registered and unregistered. Using data from the Fourth All India Census of Micro, Small and Medium Enterprises 2006–07 (registered and unregistered sector), the residual of retail spending over the size of the organised sector was divided amongst the registered and unregistered micro and small enterprises based on historical trends. Using the same data, a template enterprise was built, one each for registered micro and small and unregistered micro and small. Key inputs included the turnover per enterprise, the number of enterprises, the number of employees, the number of transactions per day and the percentage of cash transactions. Using these inputs, the cost of accepting, storing, managing, and clearing cash was estimated and expressed as a percentage of cash revenue for each enterprise sub-segment. The components of these costs were largely the same as those considered for large enterprises. The approach is thus the same across large enterprises and small and micro enterprises; however, availability of public data led us to choose specific samples for large enterprises, while paucity of data led us to use templates for small and micro enterprises.

$$\begin{aligned} \text{Cost of cash for business segment} = & \\ & (\text{size of segment} * \text{cost of cash as \% of cash revenue}) * \\ & (1 - \% \text{ of electronic transactions in segment}) \end{aligned}$$

¹⁰⁰ BCG, Retail 2020: Retrospect, reinvent and rewrite; McKinsey, The great Indian bazaar: Organised retail in India comes of age and IBEF, Retail, August 2015

Cost of cash to banks

The cost of cash to banks is primarily the cost of setting up and operating ATM and branch networks, plus costs like lost interest on cash holdings in ATMs and branches and transaction fees paid to intermediaries in payment networks.

Cost of cash to banks =
Operating expenses of branch and ATM networks +
Capital expenditure incurred on setting up new branches and ATMs +
Interest earnings (foregone) on cash deposits in branches and ATM +
Payments to cash logistics companies + Interchange fees paid + Switching fees paid

Where:

Cash holdings in ATM = [(Withdrawal transactions per day at ATM*average size of withdrawal at ATM)/2] + 100,000.
Cash holdings in ATMs are estimated as the average daily withdrawal from an individual ATM, plus an additional INR 1 lakh (USD 1,486) in urban areas and INR 50 thousand (USD 743) in rural areas, which is assumed to be held as a liquidity buffer.

Cash holdings at branch = Withdrawal transactions per day at branch *15%
Estimating cash holdings at branches is more difficult because of the many customer types and deposit transactions that occur there. Heuristically, we assumed that 15 percent of the value of daily outflows attributed to consumer withdrawals at a branch is held in cash as a liquidity reserve.

Interchange fees paid = 15*average monthly transactions at ATMs * Percentage of off-us transactions at ATMs (i.e. when the bank that issues the card is different from the one which owns the ATM)

Switching fees paid = 0.45* average monthly transactions at ATMs.
Additionally, fees are paid to other banks and network operators in the form of interchange and switching fees.

Cost of cash to the central bank

The cost of cash to the central bank comprises the cost of currency operations, the cost of maintaining large currency chests, and losses attributed to circulation of counterfeit currency.

Cost of cash to government =
Cost of currency operations + Value of counterfeit notes + Cash carrying charges of currency chest annually

Where:

Cost of currency operations = 3%* value of new currency printed annually
Value of counterfeit notes = 0.002%* value of currency in circulation

The ratio of cost of currency operations and the value of counterfeit notes to the value of new currency and value of currency in circulation is estimated from data published in the RBI's Annual Report 2015 and assumed constant for future years. To estimate the volume of currency in circulation, the ratio of value of currency to GDP to the value of cash transactions to PFCE is assumed constant for all years.

Cash carrying costs of currency chests annually = INR 20 lakh (USD 29,717)

Cost of cash due to presence of a shadow economy

Foregone revenue because of the shadow economy =

[Size of the shadow economy * Tax/GDP ratio of the formal economy]

The size of the shadow economy (as a percentage of GDP) is extrapolated from a World Bank study that provides data from 1999 to 2007. We apply the Tax/GDP ratio of 16.6 percent for FY 2015–16 published in the Ministry of Finance’s Economic Survey to compute the potential tax revenue that could be generated from increased transparency and reduction in the size of the shadow economy. This estimation is kept separately from the overall cost-of-cash framework to avoid data-skewing resulting from the large size of the shadow economy.

Note: Key metrics used in this study have been represented as a percentage of GDP at market prices. To compute such parameters, the real GDP figure for FY 2014-15 was obtained from the RBI’s “Handbook of Statistics on Indian Economy”, published in September 2015. GDP projections through FY 2024-25 were based on real GDP growth of 7.5 percent, computed from the average of real GDP growth rates projected by the World Bank, IMF, RBI, and the Economic Survey of India.

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This report contains forward-looking statements within the meaning of the U.S. Private Securities Litigation Reform Act of 1995. Forward-looking statements generally are identified by words such as "estimates", "expectation", "outlook", "will", "continued", and other similar expressions. Examples of forward-looking statements include, but are not limited to, statements we make about our revenue, operational performance, client and merchant incentives, operating margin, tax rate, earnings per share, free cash flow, operational performance, and the growth of those items.

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